

# VOLUNTARY SEARCH FEEDBACK

Art Unit \_\_\_\_\_

App./Serial # \_\_\_\_\_

## **Relevant prior art found**

- ☐ 102 rejection
- ☐ 103 rejection
- ☐ Cited as being of interest
- ☐ Helped better understand invention
- ☐ Helped better understand state of the art in technology

Types ☐ Foreign Patent(s) ☐ Non-Patent Literature

## **Relevant prior art not found**

- ☐ Results verified the lack of relevant prior art (helped determine patentability).
- ☐ Results were not useful in determining the patentability or understanding of the invention.

## **COMMENTS**

Questions about the scope or the results of the search?

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'BI ABEX' IS DEFAULT SEARCH FIELD FOR 'WPIX' FILE

=> d bib ab tech abex tot

L47 ANSWER 1 OF 22 WPIX COPYRIGHT 2008 THE THOMSON CORP on STN  
AN 2006-018122 [02] WPIX  
DNC C2006-096417 [31]  
DNN N2006-251112 [31]  
TI Encapsulated **particle** used as **controlled-release fertilizer**, comprises polyurethane layer disposed about core **particle** and comprising reaction product of **isocyanate** component and aromatic amine-based initiator-derived **polyol**  
DC A25; A97; C04; P73  
IN MENTE D C; MENTE D  
PA (BADI-C) BASF CORP; (MENT-I) MENTE D C  
CYC 110  
PIA US 20050266245 A1 20051201 (200602)\* EN 7[0]  
WO 2005118509 A1 20051215 (200602) EN  
EP 1768940 A1 20070404 (200726) EN  
KR 2007019740 A 20070215 (200755) KO  
CN 1956938 A 20070502 (200760) ZH  
MX 2006013643 A1 20070401 (200777) ES  
JP 2008500254 W 20080110 (200806) JA 17  
BR 2005011539 A 20080102 (200808) PT  
ADT US 20050266245 A1 US 2004-853826 20040526; CN 1956938 A CN 2005-80016863  
20050511; EP 1768940 A1 EP 2005-742831 20050511; WO 2005118509 A1 WC  
2005-EP5066 20050511; EP 1768940 A1 WO 2005-EP5066 20050511; KR 2007019740  
A WO 2005-EP5066 20050511; MX 2006013643 A1 WO 2005-EP5066 20050511; JP  
2008500254 W WO 2005-EP5066 20050511; KR 2007019740 A KR 2006-724477  
20061122; MX 2006013643 A1 MX 2006-13643 20061124; JP 2008500254 W JP  
2007-513736 20050511; BR 2005011539 A BR 2005-11539 20050511; BR  
2005011539 A WO 2005-EP5066 20050511

FDT EP 1768940 A1 Based on WO 2005118509 A; KR 2007019740 A Based on WO 2005118509 A; MX 2006013643 A1 Based on WO 2005118509 A; JP 2008500254 W Based on WO 2005118509 A; BR 2005011539 A Based on WO 2005118509 A

PRAI US 2004-853826 20040526

AB US 20050266245 A1 UPAB: 20060405

NOVELTY - An encapsulated **particle** comprises a core **particle** and a polyurethane layer, disposed about the core **particle**, that comprises the reaction product of an **isocyanate** component and a **polyol** derived from an aromatic amine-based initiator.

USE - The encapsulated **particle** is used as a **controlled-release fertilizer**.

ADVANTAGE - The aromaticity of the aromatic **isocyanate** component and the **polyol** serves to insure complete miscibility between the aromatic **isocyanate** and the **polyol** to form the polyurethane layer without defects preventing water from permeating the polyurethane layer and dissolving the core **particle**. The uniform, complete and defect-free polyurethane layer disposed about the core **particle** allows for **slow, controlled** dissolution of the core **particle** in the soil and alleviates a need for a second layer to be disposed about the polyurethane layer to cover any defects in the polyurethane layer. Because there are no defects in the polyurethane layer disposed about the core **particle**, water and other liquids cannot permeate the polyurethane layer and rapidly dissolve the core **particle**, thus preventing phytotoxicity.

#### TECH

AGRICULTURE - Preferred Materials: The core **particle** comprises **fertilizer**, preferably nitrogen, phosphate, potash, and/or sulfur.

INORGANIC CHEMISTRY - Preferred Material: The polyurethane layer comprises a pigment for coloring the polyurethane layer.

ORGANIC CHEMISTRY - Preferred Compound: The aromatic amine-based initiator comprises the formula (I).

R1 = alkyl, amine or H; and

R2-R6 = amine or H.

Preferably, the initiator comprises a toluene diamine, particularly 2,3-toluene diamine. The **isocyanate** component comprises an aromatic **isocyanate** component, preferably methylene diphenyl **diisocyanate** or toluene **diisocyanate**. The **polyol** is derived from a dipropylene glycol initiator in addition to the aromatic amine-based initiator.

Preferred Properties: The **isocyanate** component has a viscosity of 20-700 cP at 25degreesC, a nominal functionality of 1.5-4, and an **isocyanate** (NCO) content of 25-40%. The **polyol** has a viscosity of 5000-17000 cP at 25degreesC, a nominal functionality of 2-6, and a hydroxyl (OH) number of 350-500.

ABEX EXAMPLE - Encapsulated **particles** were prepared in beakers.

Specifically, 4 g of Pluracol **Polyol** 824 (RTM: a **polyol** derived from an aromatic amine-based initiator) was heated to 90degreesC and added dropwise to a beaker containing 100 g of commercial urea spheres to form a **polyol**-urea mixture. To the mixture was added 5 g of Lupranate M20S (RTM; an aromatic **isocyanate**), preheated to 90degreesC, and the mixture manually swirled to ensure complete contact between the commercial urea spheres and the reaction product of the **polyol** derived from an aromatic amine-based initiator and the aromatic **isocyanate**. The complete contact resulted in a polyurethane layer disposed about the commercial urea spheres. The commercial urea spheres were subsequently stirred with a foam mix blade to minimize agglomeration resulting in a free flowing group of commercial urea spheres. - Comparative examples were carried out as above except that

Comparative Example 1 utilized an aromatic **isocyanate** and a non-aromatic **polyol** that included castor oil. Similarly, Comparative Example 2 utilized an aromatic **isocyanate** and Pluracol **Polyol** GP430 (RTM; a non-aromatic **polyol** that included glycerine). - The miscibility of **isocyanate** and **polyol** was rated as 'Complete' for Example 1, 'Partial' for Comparative Example 1 and 'None' for Comparative Example 2. Dissolution time of core **particle** was more than 1 day for all 3 examples. Cure time of polyurethane layer was 5 minutes for Example 1, 1 hour for Comparative Example 1 and 4 hours for Comparative Example 2. - In comparative example 1, the polyurethane layer that was disposed about the core **particle** included defects and allowed water and other liquids to permeate the polyurethane layer and rapidly dissolve the core **particle**. Additionally, the immiscibility of the castor oil and the aromatic **isocyanate** greatly increased cure time of the polyurethane layer. Similarly, Comparative Example 2 also utilized an aromatic **isocyanate** and a non-aromatic **polyol** that was not completely miscible with the aromatic **isocyanate** and also resulted in a polyurethane layer that included defects. Additionally, the partial miscibility of the aromatic **isocyanate** and the nonaromatic **polyol** increased the cure time of the polyurethane layer.

L47 ANSWER 2 OF 22 WPIX COPYRIGHT 2008 THE THOMSON CORP on STN  
AN 2005-283846 [29] WPIX  
DNC C2006-128153 [42]

TI Coating of fertilizer particles to impart to  
them slow plant nutrient release,  
comprises simultaneously spraying preheated particles with  
**isocyanate** pre-polymer and reacting combination fluid  
DC A97; C04; G02

IN WHITTINGTON A A  
PA (WHIT-I) WHITTINGTON A A  
CYC 1

PIA US 20050076687 A1 20050414 (200529)\* EN 9[2]

ADT US 20050076687 A1 US 2003-682347 20031010

PRAI US 2003-682347 20031010

AB US 20050076687 A1 UPAB: 20051222

NOVELTY - Fertilizer particles are coated  
to impart to them slow plant nutrient  
release by simultaneously spraying the preheated particles  
with an **isocyanate** pre-polymer and reacting  
combination fluid having **polyol**, methyl ester  
derivative of a plant or vegetable oil,  
polymerization catalyst, and powder extender.

DETAILED DESCRIPTION - Coating of fertilizer  
particles to impart to them slow plant  
nutrient release comprises preheating to 125 degrees F  
and drying the fertilizer particles; simultaneously  
spraying the preheated particles with an **isocyanate**  
pre-polymer and reacting combination fluid having **polyol**  
, methyl ester derivative of a plant or  
vegetable oil, polymerization catalyst, and  
powder extender; reacting the **isocyanate** pre-  
polymer and reacting combination fluid to form a polymer  
coating on the fertilizer particles; and  
cooling the coated fertilizer particles to  
form a slow release fertilizer product.

An INDEPENDENT CLAIM is also included for a coating  
apparatus (10) for coating fertilizer



particles or pellets with a **slow-release polymer** comprising **particle** or pellet **fertilizer** preheater and drier (12); rotating **particle** or pellet **fertilizer coating** drum (14); mechanism for conveying preheated and dried **fertilizer particles** or pellets from the preheater and drier to the **coating** drum having a **fertilizer particle** or pellet entrance (24) end and product **coated fertilizer** exit (26) end; product **coated fertilizer** cooler (16) and retainer; and mechanism for collecting and conveying product **coated fertilizer particles** or pellets from the rotating **coating** drum to the product **coated fertilizer** cooler and retainer. The rotating **coating** drum has source for **isocyanate pre-polymer**, source for reacting combined fluid, central axis, axially located center beam **coating** station support (40), **coating** stages (30) spaced along the center beam, mechanism for directing the **isocyanate pre-polymer** from the source of **isocyanate pre-polymer** to each of the stages, mechanism for directing the reacting combined fluid from the source of combined fluid to each of the stages, nozzle connected with the mechanism for directing **isocyanate pre-polymer** and located at each the stage, and corresponding nozzle connected with the mechanism for directing reacting combined fluid and located at each the stage. The nozzle is directed for discharge of **isocyanate pre-polymer** toward the **fertilizer particles** or pellets. The **isocyanate** monomer directing nozzle and the corresponding combined fluid nozzle are located at the same position lengthwise relative to the center beam support at each of the stages. The **coated fertilizer** product cooler and retainer is receiving hot product from the **coating** drum and cooling the product to ambient temperature.

ACTIVITY - **Fertilizer**.

MECHANISM OF ACTION - None given.

USE - The invention is for **coating fertilizer particles** to impart to them **slow plant nutrient release** to provide high quality fully **coated fertilizer** product.

ADVANTAGE - The invention provides a **coated fertilizer** product for **slow release** of **plant nutrients** that is highly abrasion resistant. It provides **coated fertilizer** product having bright brilliant colors, superior hydrophobic qualities, leaves no toxic residue in the soil, and avoids dust and odor during the application step. It reduces sticky buildup in the **coating** equipment.

DESCRIPTION OF DRAWINGS - The figure is a diagrammatic plan view of a **coating** apparatus for **coating fertilizer**.

Coating apparatus (10)  
 Drier (12)  
 Rotating **particle** or pellet **fertilizer** **coating** drum (14)  
 Product **coated fertilizer** cooler (16)  
**Fertilizer particle** or pellet entrance (24)  
 Product **coated fertilizer** exit (26)  
 Coating stages (30)  
 First tank (32)  
 Second tank (36)  
 First feed line (34)  
 Second feed line (38)  
 Axially located center beam **coating** station support (40)  
 Storage bin (62)

## TECH

MECHANICAL ENGINEERING - Preferred Component: The **fertilizer** preheater and drier is a rotating drum. The **coated fertilizer** product cooler and retainer is a rotating cooling and retention drum. The source for **isocyanate pre-polymer** source is a first tank (32) and feed line. The mechanism for directing **isocyanate prepolymer** from the source to each of the stages is a first header supported with the center beam and fluidly connecting the first feed line (34) and the first header. The source for reacting combined fluid is a second tank (36) and feed line, the and the mechanism for directing combined fluid from the source to each of the stages is a second header supported with the center beam and fluidly connecting the second feed line (38) and the second header. The second tank has mechanism for stirring the combined fluid held therein. The nozzle for discharge of **isocyanate** monomer comprises spray head for spraying **isocyanate** monomer toward the **fertilizer particles** or pellets. The corresponding nozzle for discharge of combined fluid comprises a spray head for spraying combined fluid toward the **fertilizer particles** or pellets to form a **coating** stage in the rotating **coating** drum. There are four **coating** stages formed in the rotating **coating** drum each having an **isocyanate pre-polymer** spray head and a corresponding combined fluid spray head. The **coating** drum has a pitch of 15 degrees downward from the **fertilizer particle** or pellet entrance end and the **coated** product exit end. The **fertilizer particles** or pellets are moving through each **coating** stage as they travel between the entrance end and the exit end. The **coating** apparatus further includes storage bin (62), and collecting conveyer located between the cooling and detention drum. The storage bin is for collecting cooled **coated fertilizer** product from the cooling and detention drum and conveying the cooled **coated fertilizer** product to the storage bin for storage.

INORGANIC CHEMISTRY - Preferred Component: The **powder** extender in the reacting combination fluid comprises **barium sulfate**. The **fertilizer particles** are from **granules**, chunky **granules**, prills, pellets, extrusion, shot, lumps, grains, crystals, or flakes. They consist sulfate-based **fertilizers**, preferably potassium sulfate.

POLYMERS - Preferred Component: The combination fluid further comprises an oil-based **dye**, **micronutrients** from **copper** compounds or **zinc** compounds, and pesticides. The **isocyanate pre-polymer** is from diphenylmethane diisocyanate, toluene diisocyanate, or polymeric diphenylmethane diisocyanate. The **polyol** is from polyester **polyol**, polyether **polyol**, or polyethylene glycol. The **polymerization** catalyst is from **dibutyl tin dilaurate**, triethylene diamine, or methyl diethanolamine. The **methyl esters** of **plant** or **vegetable oils** are from **methyl esters** of cottonseed oil, linseed oil, or soybean oil. The combined fluid further comprises **plant** or **vegetable oils** from cottonseed oil, linseed oil, **waxes** from paraffin and microcrystalline **waxes**, or **powders** from diatomaceous earth, calcium carbonate, clays, or silicas

Preferred Concentration: There are 6g of a pre-polymer and reacting combination fluid having 3g polyether **polyol**, 3g

soy bean oil methyl ester,  
1/4g dibutyl tin dilaurate catalyst, and 3g  
barium sulfate applied through spraying for each pound  
of fertilizer particles coated.  
Preferred Process: The spraying step and reacting steps are repeated a  
number of times corresponding to the number of layers of coating  
desired on the fertilizer particles. They are  
successively carried out in stages as the fertilizer  
particles travels through a multi-stage coating drum  
resulting in fertilizer particles having four  
coatings. There are four spraying and reacting steps carried out  
in four stages.

L47 ANSWER 3 OF 22 WPIX COPYRIGHT 2008 THE THOMSON CORP on STN

AN 2005-083381 [10] WPIX

DNC C2005-029093 [10]

TI Coated granular fertilizer for slow  
release in paddy field, comprises granular  
fertilizer coated with polyurethane film, obtained by  
reacting polyester polyol containing hardened castor oil and/or  
castor oil with polyisocyanate

DC A97; C04

PA (SUMO-C) SUMITOMO CHEM CO LTD

CYC 1

P1A JP 2005001957 A 20050106 (200510)+ JA 8[0]

ADT JP 2005001957 A JP 2003-168921 20030613

PRAI JP 2003-168921 20030613

AB JP 2005001957 A UPAB: 20050708

NOVELTY - Coated granular fertilizer  
comprising granular fertilizer coated with  
polyurethane film, obtained by reacting polyester polyol  
component (PEPC) and polyisocyanate component (PIC), is new.

DETAILED DESCRIPTION - Coated granular  
fertilizer comprises granular fertilizer  
coated with polyurethane film, obtained by reacting polyester  
polyol component (PEPC) and polyisocyanate component  
(PIC). PEPC contains hardened castor oil (HCO) and/or castor oil (CO). The  
ratio of HCO with respect to sum total of HCO and CO is 20 weight% or more.  
The equivalence ratio between NCO group of PIC and hydroxyl group of PEPC  
is 0.9-1.2.

An INDEPENDENT CLAIM is also included for manufacture of  
coated granular fertilizer having polyurethane  
film, which involves providing granular fertilizer in  
fluid or rolling state, adding mixture of hardened castor oil and/or  
castor oil, polyisocyanate and catalyst, mixing, maintaining  
fluid or rolling state and hardening the mixture on the granular  
fertilizer.

ACTIVITY - Fertilizer. No biological data given.

MECHANISM OF ACTION - None given.

USE - The coated granular fertilizer  
is used as naturally disintegrating slow release  
coated granular fertilizer used in paddy  
field.

ADVANTAGE - The coated granular  
fertilizer has natural disintegration property, and exhibits  
favorable elution retardancy of fertilizer component. The  
slow release coated granular  
fertilizer can be easily manufactured industrially.

TECH

ORGANIC CHEMISTRY - Preferred Process: Catalyst and polyester

**polyol** component are mixed. The mixture is mixed with **polyisocyanate** component, and the reaction between polyester **polyol** component and **polyisocyanate** component is performed. Mixture having equivalence ratio of 0.9-1.2 between CNO group of **polyisocyanate** component with respect to OH group of hardened castor oil and/or castor oil, is mixed with primary preparation (obtained by mixing hardened castor oil and/or castor oil, with catalyst). Preferred Amount: The **coating** quantity of polyurethane film with respect to **granular fertilizer** is 6-16 wt.%.

ABEX EXAMPLE - **Granular** urea having average **particle** diameter of 3.1 mm (5 kg) was rotated at 20-30 rpm. Non-hardened urethane resin was obtained by mixing hardened castor oil having hydroxyl value of 156 mg/g (18.1 g) dissolved in 2,4,6-tris(dimethyl aminomethyl)phenol (0.2 g) homogenous mixture at 90 degrees centigrade with **polymeric** diphenyl methane **diisocyanate** (6.8 g) at room temperature. The non-hardened urethane resin was rapidly added to the **granular** urea maintained in rolling state, at 70 degrees centigrade. Non-hardened urethane resin was liquefied during mixing and addition. The gelling time of non-hardened urethane resin was 2 minutes and 30 seconds, at 70 degrees centigrade. The supplied amount of non-hardened urethane resin was 0.5 wt.% with respect to **fertilizer** preparation. When the **granular fertilizer** was **coated**, the film thickness of the **coated** urethane resin was set to 3.1 micrometer. Visual observation showed that the **granular fertilizer** was substantially uniformly **coated** with non-hardened urethane resin within 30 seconds. Urethane resin **coating** process was repeated 15 times, each 3 minutes. **Coating** (8 wt.%) was provided to **granular fertilizer**. Then, maintained at 73 degrees centigrade for 3 minutes and the resin was completely cured to obtain **coated granular fertilizer**. The **coated granular fertilizer** (7.5 g) was added to sample bottle, water (100 ml) was added and kept at 25 degrees centigrade. Water (0.5 ml) was taken from the bottle after predetermined time and urea concentration was measured. The elution proportion of urea was calculated from the measured urea concentration. The elution proportion of urea was found to be 0 %, 13 %, 27 %, 31 %, 55 %, 70 % and 81 % after 0, 10, 20, 30, 40, 50, 60 and 70 days.

L47 ANSWER 4 OF 22 WPIX COPYRIGHT 2008 THE THOMSON CORP on STN

AN 2004-065153 [07] WPIX

DNC C2005-239098 [80]

DNN N2005-643850 [80]

TI **Coated** biological active substance for cultivating crops, is obtained by **coating** biological active substance with polyurethane, which is obtained by reacting **polyols** having preset hydroxy equivalents with **isocyanate**

DC A25; A97; C04; P13

IN UCHINO M

PA (CHCC-C) CHISSO CORP

CYC 1

PIA JP 2003183104 A 20030703 (200407)\* JA 7[0]

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ADT JP 2003183104 A JP 2001-388247 20011220

PRAI JP 2001-388247 20011220

AB JP 2003183104 A UPAB: 20060203

NOVELTY - A **coated** biological active substance is obtained by **coating** biological active substance with polyurethane. The polyurethane is obtained by reacting **polyol** having hydroxy equivalent of 120 or less and **polyol** having hydroxy equivalent of 150 or more with **isocyanate**.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

(1) biological active substance composition, containing the **coated** biological active substance; and

(2) cultivation of crops, which involves using the above composition.

ACTIVITY - **Fertilizer**.

No biological data is given.

MECHANISM OF ACTION - None given.

USE - As agrochemical or **fertilizer** for cultivating crops (claimed), such as edible crops e.g. rice, fodder crops e.g. bean family **plants**, spice crops e.g. pepper, **oil** crops e.g. sesame, sugar crops e.g. sugar beet and fiber crops e.g. cotton.

ADVANTAGE - The **coated** biological active substance exhibits controlled/favorable dissolution and elution pattern. The substance effectively promotes **growth** of agricultural products and useful **plants** without generating **growth** failure. The substance improves the yield and quality of agricultural products. The substance has excellent disease preventing effect, insect-pest preventing effect and weed preventing effect.

TECH

AGRICULTURE - Preferred Substance: The biological active substance is an agrochemical or **fertilizer**.

ORGANIC CHEMISTRY - Preferred Amount: The amount of **polyol** having hydroxy equivalent of 120 or less is 5-90 wt.%.

ABEX EXAMPLE - 70% pure 1-(6-chloro-3-pyridyl methyl)-N-nitro imidazolidine-2-ylidene amine (agrochemical) (3 wt.pts.), bentonites (65 wt.pts.), clay (31 wt.pts.) and sodium lignisulfonate (1 wt.pt), were knead-mixed uniformly, **granulated** and dried to obtain agrochemical **granules**. Dried **granules** (3.4 mm mean **particle** diameter) (920 g) were **coated** using film forming material containing propylene glycol (having hydroxy equivalent of 38) (7 g), polypropylene glycol (hydroxy equivalent of 350) (35 g) and **polymeric** diphenyl methane **diisocyanate** (MDI) (38 g) in the presence of an amine catalyst at 65-75 degreesC for 40 minutes, to obtain a **coated** biological active substance (CBA), having excellent insecticidal effect. The CBA when mixed with rice **plant** seeds and irrigated for 20 days at 18-28 degreesC, promoted the **growth** of rice **plant** remarkably.

L47 ANSWER 5 OF 22 WPIX COPYRIGHT 2008 THE THOMSON CORP on STN

AN 2003-636508 [60] WPIX

DNC C2003-173902 [60]

TI **Coated granules** used for **fertilizers**, insecticides, **plant** protection agents, fungicides and drying agents include **coating** of resin comprising reaction product of cardol or cardanol with **isocyanate**

DC A21; A25; A97; C04; C07

IN KUHLMANN P; PRIEBE C; WINTER R

FA (ASHL-N) ASHLAND-SUEDCHEMIE-KERNFEST GMBH; (KUHL-I) KUHLMANN P; (PRIE-I) PRIEBE C; (WINT-I) WINTER R

CYC 99

PIA	WO 2003048075	A1	20030612 (200360)*	DE	17[0]	<--
	DE 10158693	A1	20030626 (200360)	DE		<--
	AU 2002351700	A1	20030617 (200419)	EN		<--
	EP 1451129	A1	20040901 (200457)	DE		
	DE 10295611	T	20041014 (200468)	DE		
	BR 2002014523	A	20041103 (200482)	PT		
	US 20050005661	A1	20050113 (200506)	EN		
	JP 2005511465	W	20050428 (200530)	JA	16	

EP 1451129 B1 20050713 (200547) DE  
 DE 50203642 G 20050818 (200557) DE  
 ES 2242079 T3 20051101 (200577) ES  
 MX 2004005102 A1 20050701 (200628) ES  
 AU 2002351700 B2 20070913 (200801) EN  
 ADT WO 2003048075 A1 WO 2002-DE4352 20021127; DE 10158693 A1 DE  
 2001-10158693 20011129; AU 2002351700 A1 AU 2002-351700  
 20021127; BR 2002014523 A BR 2002-14523 20021127; DE  
 10295611 T DE 2002-10295611 20021127; DE 50203642 G DE  
 2002-503642 20021127; EP 1451129 A1 EP 2002-787406 20021127  
 ; EP 1451129 B1 EP 2002-787406 20021127; DE 50203642 G EP  
 2002-787406 20021127; ES 2242079 T3 EP 2002-787406 20021127  
 ; EP 1451129 A1 WO 2002-DE4352 20021127; DE 10295611 T WO  
 2002-DE4352 20021127; BR 2002014523 A WO 2002-DE435 20021127  
 ; US 20050005661 A1 WO 2002-DE4352 20021127; JP 2005511465 W  
 WO 2002-DE4352 20021127; EP 1451129 B1 WO 2002-DE4352  
 20021127; DE 50203642 G WO 2002-DE4352 20021127; MX  
 2004005102 A1 WO 2002-DE4352 20021127; JP 2005511465 W JP  
 2003-549270 20021127; MX 2004005102 A1 MX 2004-5102 20040527; US  
 20050005661 A1 US 2004-497196 20040527; AU 2002351700 B2 AU  
 2002-351700 20021127  
 FDT DE 50203642 G Based on EP 1451129 A; ES 2242079 T3 Based on  
 EP 1451129 A; AU 2002351700 A1 Based on WO 2003048075 A; EP  
 1451129 A1 Based on WO 2003048075 A; DE 10295611 T Based on WO  
 2003048075 A; BR 2002014523 A Based on WO 2003048075 A; JP  
 2005511465 W Based on WO 2003048075 A; EP 1451129 B1 Based on WO  
 2003048075 A; DE 50203642 G Based on WO 2003048075 A; MX  
 2004005102 A1 Based on WO 2003048075 A; AU 2002351700 B2 Based on WO  
 2003048075 A

PRAI DE 2001-10158693 20011129

AB WO 2003048075 A1 UPAB: 20060202

NOVELTY - **Coated granules** include a **coating** of a resin comprising the reaction product of cardol, cardanol, their derivatives and/or oligomers with an **isocyanate** component, and the resin is applied in a very thin layer.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is included for preparation of the **coated granules** which comprises:

- (a) preparation of the **granular** material;
- (b) preparation of a **polyol** component including cardol, cardanol, their oligomers and/or derivatives and an **isocyanate** component;
- (c) mixing the **polyol** and **isocyanate** components;
- (d) adding the mixture from step (c) or the **polyol** component and the **isocyanate** component as a single entity to the prepared **granular** substance to deposit a **coating** mixture on the **granular** material;
- (e) hardening the mixture from step (d), and
- (f) preferably repeating steps (d) and (e) to deposit the **coating** mixture on the **granular** material in a number of cycles, e.g. 2-10 cycles.

USE - Useful for **fertilizers**, insecticides, plant protection agents, fungicides and/or drying agents.

ADVANTAGE - The resin can be applied sparingly and specifically because of its low adhesion, and when applied to **fertilizers**, it enables more **nutrients** to be applied to the **plants**, over long periods and continuously, with reproducible release behavior.

TECH

POLYMERS - Preferred Components: The composition comprises a **coated granular** material (CGM) where the **polyol**

component is obtained by epoxidation, maleination, or hydrogenation of cardol or cardanol or by reaction of cardol and/or cardanol or by maleination, epoxidation, or hydrogenation of the compounds obtained with an aldehyde (sic). The **polyol** component after heating of cashew nut oil and distilling off the cardol and cardanol in the reaction sump (sic) is a residual oligomer. The **polyol** component includes an OH group containing plasticizer and/or an OH group containing diluting agent, and/or a phenol/aldehyde condensation product, and/or other conventional additives. The phenol/aldehyde condensation product comprises novolac or benzylether resin.

The resin **isocyanate** component is an aliphatic, aromatic or heterocyclic **isocyanate** with at least two **isocyanate** groups in a molecule or its oligomers or **polymers**, e.g. toluene **diisocyanate**, diphenylmethane **diisocyanate**, or an oligomer based on them.

Preferred Process: In step (e), an amine catalyst is used for hardening.

AGRICULTURE - Preferred Components: The **coated granular** material (CGM) is water soluble. The CGM comprises **fertilizers**, **plant** protection agents, insecticides, pesticides, fungicides and/or drying agents. The CGM is an NPK-**fertilizer**. The amount of **coating** mixture is 3-15 wt.% based on the amount of CGM. The grain size of the CGM is 1-10 mm.

ABEX EXAMPLE - A **polymer** formulation contained (in g): **polymer** resin (25), castor oil (60), diethylene glycol (10) and molecular sieve (5). The **polymer** resin was obtained from phenol condensate obtained from paraformaldehyde, and **zinc** acetate in 85% yield.

L47 ANSWER 6 OF 22 WPIX COPYRIGHT 2008 THE THOMSON CORP on STN

AN 2002-464714 [50] WPIX

DNC C2002-132340 [50]

DNN N2002-366284 [50]

TI Horticultural medium for plant **growth**, comprises hydrophilic **polyisocyanate-polyol-based polymer**, and filler material

DC A26; A32; A97; P13

IN FRISCH K C; HANN D G; SENDIJAREVIC V

PA (SMIT-N) SMITHERS OASIS CO

CYC 29

PIA EP 1192852 A2 20020403 (200250)\* EN 22[4] <--

CA 2356830 A1 20020402 (200250) EN <--

JP 2002165520 A 20020611 (200253) JA 11 <--

US 6479433 B1 20021112 (200278) EN <--

ADT EP 1192852 A2 EP 2001-121423 20010907; US 6479433 B1 US 2000-678870 20001002; CA 2356830 A1 CA 2001-2356830 20010910; JP 2002165520 A JP 2001-289074 20010921

PRAI US 2000-678870 20001002

AB EP 1192852 A2 UPAB: 20050902

NOVELTY - A horticultural medium comprises a hydrophilic **polyisocyanate-polyol-based polymer**, and a filler material (12).

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for:

(A) a method of making the above-mentioned horticultural **growing** medium comprising mixing a filler material with **polyisocyanate-polyol-based quasi-prepolymer**, forming a quasi-**prepolymer**/filler mixture (24); and applying water to the mixture;

(B) a method of **growing** plant seedlings comprising planting a seed or seedling in the above horticultural **growing** medium;

(C) a hydrophilic urethane **polymer** comprising the reaction product of quasi-**prepolymer** and water; and

(D) a method of making a hydrophilic polyurethane comprising adding a hydrophilic **polyol** to an **isocyanate**, mixing the **polyol** and **isocyanate** to form a quasi-**prepolymer**, and contacting the quasi **prepolymer** with water.

USE - For horticultural applications, i.e. as medium for plant growth.

ADVANTAGE - The invention displays flexibility, strength, and wetting characteristics.

DESCRIPTION OF DRAWINGS - The figure is a schematic view of a mixing apparatus for making horticultural **growing** medium.

Filler material (12)

Quasi-**prepolymer**/filler mixture (24)

Mold (30)

TECH

**POLYMERS** - Preferred Component: The hydrophilic **polyisocyanate-polyol-based polymer** is a reaction product of:

(a) **polymethylene polyphenylene polyisocyanate** having an average **cyanate** (NCO) functionality of 2-3 and a **polyol**;

(b) a reaction product of diphenylmethane **diisocyanate** and a polyether glycol; and

(c) reaction product of water and quasi-**prepolymer** having an NCO:OH equivalent weight ratio of 3:1-6:1.

The **polyol** consists of random **copolymers** and block **copolymers** or propylene oxide and ethylene oxide.

Preferred Medium: The **growing** medium is deposited to mold (30) and allowed to solidify to form a molded **growing** medium.

ABEX EXAMPLE - A quasi-**prepolymer** was synthesized by adding 580 g of **polyol** UCON 75H1400 to 251 g of **isocyanate** PAPI 2094. The mixture was mixed for 5-10 minutes without nitrogen and quasi-**prepolymer** was stored at 25degreesC. It had an NCO:OH equivalent weight ratio of 4:1. The viscosity (cPs) of the **prepolymer** was determined after 3-5 days. The NCO percentage of the **prepolymer** was determined by di-n-butyl amine titration. The viscosity at 3 days was 10100, at 5 days was 10700. The theoretical NCO% was 7.3, and the actual NCO% after 5 days was 6.9.

L47 ANSWER 7 OF 22 WPIX COPYRIGHT 2008 THE THOMSON CORP on STN

AN 2002-259660 [31] WPIX

DNC C2002-077323 [31]

TI Production of polyurethane encapsulated, **slow release fertilizer particles** involves sequentially applying **isocyanate-reactive component** comprising oleo **polyol**, and **polyisocyanate component** on **fertilizer particles**

DC A25; A97; C04

IN CLINE R L; MARKUSCH P H; SARPESHKAR A M

PA (FARB-C) BAYER CORP; (MILE-C) MILES LAB INC

CYC 30

PIA EP 1172347 A2 20020116 (200231)\* EN 10[0] <--

CA 2352442 A1 20020111 (200231) EN <--

US 6358296 B1 20020319 (200231) EN <--

JP 2002114591 A 20020416 (200242) JA 10 <--

MX 2001006872 A1 20020801 (200366) ES <--

MX 223483 B 20041013 (200557) ES

ADT EP 1172347 A2 EP 2001-114816 20010627; US 6358296 B1 US

2000-613680 20000711; CA 2352442 A1 CA 2001-2352442 20010705



; MX 2001006872 A1 **MX 2001-6872 20010705**; MX 223483 B **MX 2001-6872 20010705**; JP 2002114591 A **JP 2001-207716 20010709**

PRAI **US 2000-613680 20000711**

AB EP 1172347 A2 UPAB: 20060119

NOVELTY - Polyurethane encapsulated, **slow release fertilizer particles** are made by applying an **isocyanate**-reactive component on **fertilizer particles** to form **coated fertilizer particles**; and applying a **polyisocyanate** component on the **coated fertilizer particles** to form polyurethane encapsulated **fertilizer particles**. The **isocyanate**-reactive component comprises an oleo **polyol**.

USE - For producing polyurethane encapsulated, **slow release fertilizer particles**.

ADVANTAGE - The inventive method produces polyurethane encapsulated, **slow release fertilizer particles** that does not present any harm to the environment, and have superior **slow release** properties when compared to castor oil alone or when compared to castor **oils** which are chemically modified with methylol groups containing resins. The method provides encapsulation of the layers with high homogeneity.

TECH

**POLYMERS** - Preferred Composition: The polyurethane encapsulated **fertilizer particles** comprises 4-10, or 2-20 wt.% polyurethane based on the total weight of the encapsulated **fertilizer** composition.

Preferred Component: The **polyisocyanate** comprises a liquid **polymethylene poly(phenylisocyanate)** composition.

Preferred Property: The oleo **polyol** has a viscosity of less than 2000, preferably 1300 mPaasterisks; has an hydroxy (OH) number of 215; a molecular weight of 914; an equivalent weight of 261; and a functionality of 3.5.

Preferred Condition: The ratio of the **isocyanate** groups contained in the **polyisocyanate** to **isocyanate**-reactive groups contained in the **iso-cyanate** reactive component is 0.8:1-2.0:1, preferably 0.93:1-1.1:1.

Preferred Method: The steps are optionally repeated (successively) as many times as necessary, with the polyurethane encapsulated **fertilizer particles** being substituted for the **isocyanate**-reactive **coated fertilizer particles**, to form polyurethane encapsulated **fertilizer particles**.

ORGANIC CHEMISTRY - Preferred Component: The oleo **polyol** is derived from natural **oils** comprising castor oil, soybean, sunflower or linseed oil (preferably castor oil).

ABEX EXAMPLE - Encapsulated **fertilizer granules** were prepared comprising (g): urea pellets (100); Sovermol 815 (RTM: an oleo chemical **polyol** obtained by reacting an alcohol with an epoxidized castor **oil**, having an OH number of 215, a molecular weight of 914, an equivalent weight of 261, a functionality of 3.5, and a viscosity of 1,300 mPaasterisks) (1.36); a **polymethylene poly(phenylisocyanate)** (0.72); Dabco T-12 (RTM: a dibutyltin dilaureate catalyst) (0.0027). The polyurethane encapsulation was 5.16%. After 8 hours storage of the encapsulated **fertilizer granules**, 30.6% of the encapsulated urea was dissolved.

L47 ANSWER 8 OF 22 WPIX COPYRIGHT 2008 THE THOMSON CORP on STN  
AN 2001-599814 [68] WPIX  
DNC C2001-177420 [68]  
TI Coated granular fertilizer comprises

specific amount of carnauba **wax** and polyurethane resin obtained by reaction of **oil** modified alkyl resin and diphenyl methane **diisocyanate** and/or tolylene **diisocyanate**

DC A25; A97; C04

IN MIKI S; NAGAOKA Y; OKADA T

PA (TAKG-C) TAKI CHEM CO LTD

CYC 1

PIA JP 2001163691 A 20010619 (200168)\* JA 6[0]

<--

ADT JP 2001163691 A JP 1999-352529 19991213

PRAI JP 1999-352529 19991213

AB JP 2001163691 A UPAB: 20050526

NOVELTY - **Coated granular fertilizer**

comprises carnauba **wax** (B) and polyurethane (PU) resin obtained by reaction of **oil** modified alkyl resin (A) and diphenyl methane **diisocyanate** and/or tolylene **diisocyanate** (C). The weight ratio of PU resin and carnauba **wax** ranges between 1:0.25-1:1.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for manufacture of **coated granular fertilizer** which comprises spraying a mixture of (A) and (B), and (C) separately, to **fertilizer** grain and drying.

USE - For use as **fertilizers**.

ADVANTAGE - The **coated fertilizer** performs elusion accurately for prolonged time. Use of organic solvent is prevented, thereby avoiding damage due to fire. The manufacturing method is simple.

TECH

ORGANIC CHEMISTRY - Preferred Process: The components (A)-(C) are separately heat processed at the softening point of carnauba **wax** or above melting point of carnauba **wax** after spraying and drying processes. The spraying and drying processes are repeatedly performed more than 5 times.

ABEX EXAMPLE - **Granular** urea (500 g) having mean **particle** diameter of 3 mm was taken in a **coating** apparatus. Hot air was passed and the temperature was maintained at 70degreesC. Cobalt salt (0.2 g) of aliphatic monocarboxylic acid and potassium salt (0.4 g) of aliphatic monocarboxylic acid were added as catalyst, to **linseed oil-castor oil** modified alkyl resin (40 g). The solution was heated to form **polyol** solution. Carnauba **wax** was melted at 100degreesC and the **wax** (30 g) was taken. To the **granular** urea, **polyol** solution formed above was sprayed for 10 seconds at a rate of 0.08 g/second. Subsequently, molten carnauba **wax** was sprayed for 10 seconds at 0.08 g/second. The spray **coat** was dried for 5 minutes to form a film. The **coating** was repeated for 20 times and dried in air drier at 90degreesC for 1 hour. The coverage of **coated granular fertilizer** was found to be 8.8% and elusion amount after 10 days, 30 days, 50 days, 70 days and 90 days were found to be 1.5%, 5.2%, 36.2%, 72.4% and 89.5%, respectively.

L47 ANSWER 9 OF 22 WPIX COPYRIGHT 2008 THE THOMSON CORP on STN

AN 1996-353715 [35] WPIX

DNC C1996-111377 [35]

TI Attrition resistant, **controlled release** fertiliser **particles** - comprise **nutrient**-containing core surrounded by organic **wax coating** and **coating** derived from reaction between **poly-isocyanate** and **polyol**

DC A17; A25; A97; C04

IN HUDSON A P; ROBINSON L; WOODWARD F E

PA (HUDS-I) HUDSON A P; (ROBI-I) ROBINSON L; (WOOD-I) WOODWARD F E

CYC 1  
 PIA US 5538531 A 19960723 (199635)\* EN 10[0] <--  
 ADT US 5538531 A CIP of US 1991-719975 19910624; US 5538531 A  
 US 1994-177910 19940106  
 PRAI US 1994-177910 19940106  
 US 1991-719975 19910624

AB US 5538531 A UPAB: 20050512  
 An attrition resistant, **controlled release** fertiliser comprises a **coated** core of **particulate** fertiliser containing a water soluble **plant nutrient**, one of the **coatings** being an inner **coating** being the reaction prod. of: (i) a **polyisocyanate** selected from diphenylmethane **diisocyanate**, toluene **diisocyanate** and/or their derivs. or **polymers** which contain 1.5-3 **isocyanate** gps. per molecule and 10-50% NCO; and (ii) a **polyol** having 2-6 OH gps. and one 10-22C aliphatic moiety. The ratio of **polyisocyanate** NCO gps. to **polyol** OH gps. is 0.8-3 and another **coating** consists of an organic **wax** having a drop m.pt. of 50-120 °C. Also claimed is the production of the above fertiliser which comprises: (i) heating fertiliser **particles** above the **polyol** component's m.pt. but X226F100 °C; (ii) mixing by gentle agitation and adding the aforementioned polyol to achieve the desired 6.8-3 NCO:OH ratio and a uniform polyol **distribution**; (iii) reacting with the aforementioned polyisocyanate to form a solidified polyurethane coating on the fertiliser particles; (iv) adding an organic **wax** with a 50-120 °C drop m.pt. to produce an outer wax **coating**; and (v) cooling with continuous agitation to below the wax m.pt.

ADVANTAGE - The process facilitates the production of bagged fertilisers that maintain their water insoluble nitrogen (WIN) content during shipping and storage. It also avoids the problems associated with conventional **particulate** fertilisers e.g. phytotoxicity caused by rapid **release** of **plant food**, **nutrient** depletion by leaching and vapour hazards due to application of **coatings** using solvents.

L47 ANSWER 10 OF 22 WPIX COPYRIGHT 2008 THE THOMSON CORP on STN  
 AN 1992-409875 [50] WPIX  
 DNC C1992-181773 [21]

TI Biodegradable **coated granular** fertiliser - prepared by **coating** fertiliser with reaction prod. of **polyisocyanate** and **polyhydroxyl** cpd. derived from e.g. wool grease

DC A25; A97; C04; D23  
 IN HATANO K; IWAGAMI A; UCHIDA Y; YAMASHITA M  
 PA (YUKI-N) YUKISHITSU HIRYO SEIBUTSU KASSEI RIYOU

CYC 1  
 PIA JP 04305085 A 19921028 (199250)\* JA 6[0] <--  
 ADT JP 04305085 A JP 1991-66508 19910329  
 PRAI JP 1991-66508 19910329  
 AB JP 04305085 A UPAB: 20050505

A **coated granular** fertiliser is prepared by **coating** a **granular** fertiliser is prepared by **coating** a **granular** fertiliser with the reaction prod. of (i) **polyhydroxyl** cpd(s). of wool grease, lanolin, lanolin fatty acid(s) or a lanolin alcohol recovered upon washing wool or mixture of these cpds., with (ii) **polyisocyanate**. Preparation of the **coated granular** fertiliser involves attaching an organic solvent solution of the **polyhydroxyl** cpd.(s) and **polyisocyanate** to the surface of a **granular**

fertiliser, pref. immersing the **granular** fertiliser in the organic solvent solution and then withdrawing it, or pref. spraying the organic solvent solution on a **granular** fertiliser which is in the fluid state, and then evaporating the organic solvent, and pref. repeating the processes of attachment of the organic solvent solution and evaporation of the organic solvent.

USE/ADVANTAGE - Fertiliser is **coated** with urethane-like reaction prod. of natural **polyhydroxyl** cpd(s). derived from wool and **polyisocyanate**. Homogeneous **coat** is formed on the surface of the **granular** fertiliser, permitting modification of the thickness of the **coat**, thereby regulating the rate of dissolution of the fertiliser component. In addition, the **coat** has a biodegradability, and avoids environmental pollution or residual problem.

L47 ANSWER 11 OF 22 WPIX COPYRIGHT 2008 THE THOMSON CORP on STN  
AN 1988-301638 [43] WPIX  
DNC C1988-133618 [21]  
DNN N1988-228940 [21]

TI Friable aerated fibrous polyurethane materials - for plant **growth** media, obtd. from **poly:ol** e.g. sucrose with **poly:isocyanate** especially di:phenylmethane di:**isocyanate** in tert. aliphatic amine

DC A25; A97; C03; P13

IN GALAN M; JOLLY A J

PA (SOPH-N) SOPHOPAR SOC PARTIC

CYC 1

FIA FR 2611725 A 19880909 (198843)\* FR 9[0]

<--

ADT FR 2611725 A FR 1987-2665 19870227

PRAI FR 1987-2665 19870227

AB FR 2611725 A UPAB: 20050429

Polyurethane-based materials have a friable aerated fibrous structure, absorb at least 90% of their volume of water in a short time when immersed in water and release at least 90% of the absorbed water in the same short time when removed from the water.

The materials are produced by reacting a **polyol** (I) with a **polyisocyanate** (II) in the presence of a catalyst (III) and a blowing agent (IV) under conditions such that the exothermic reaction produces a higher core temperature than is normal for foam production, the reaction

pref. being stopped when the core temperature reaches 100-120 deg. C.. (I) is especially a sucrose or sorbitol derivative with an OH number of 500-700. (II) is especially

4,4'-diphenylmethane di**isocyanate** (DDI). (III) is a tert. aliphatic amine. (IV) is a 'Freon', CH<sub>2</sub>Cl<sub>2</sub> or H<sub>2</sub>O. The reaction mixture may also contain a silicone-type surfactant. The (II):(I) weight ratio is 140-160:100.

USE - The materials are useful as plant **growth** media.

L47 ANSWER 12 OF 22 WPIX COPYRIGHT 2008 THE THOMSON CORP on STN  
AN 1987-362376 [51] WPIX  
CR 1988-063879  
DNC C1987-155212 [21]

TI Attrition resistant **controlled release** fertilisers - formed by surrounding fertiliser containing amino gps. with polyfunctional **isocyanate**, then organic **poly:ol**

DC A23; A25; A97; C04

IN MOORE W P

PA (MOOR-I) MOORE W P

CYC 1  
 PIA US 4711659 A 19871208 (198751)\* EN 8[0] <--  
 ADT US 4711659 A US 1986-897160 19860818  
 PRAI US 1986-897160 19860818  
 AB US 4711659 A UPAB: 20060105  
 An attrition resistant, **controlled release**, fertiliser  
**particle** compsn. comprises: (a) a water soluble central mass of a  
 plant food cpd. containing NH<sub>2</sub> functional gps. amounting to at least 10%, (b)  
 a base **coating**, surrounding and chemically bonded to the central  
 mass and consisting of substd. ureas, formed by reacting a molecular  
 excess of a liquid polyfunctional **isocyanate** (I) with the NH<sub>2</sub>  
 functional gps. of the central mass and (c) a water insoluble sealing  
 layer, surrounding and chemically bonded to the base **coating**,  
 formed by the reaction and **polymn.** of the excess polyfunctional  
**isocyanate** of the base **coating** with an amount of anhydrous  
 organic **polyol** (II) sufficient to produce a NCO to OH moiety  
 ratio between 1 and 3.  
 Pref. (I) is **polymeric** diphenylmethane **diisocyanate**  
 containing 30-33% NCO and exhibiting a viscosity of 60-120 cP at 25 deg.C.  
 Pref. (II) is selected from aliphatic, aromatic and aliphatic aromatic  
 polyethers and polyesters terminating in OH gps., the **polyols**  
 containing less than 0.1% water and exhibiting hydroxyl numbers of 200-400.  
 Pref. the water soluble central mass is a **particle** or fertiliser  
 selected from urea, biuret, guanidine, ureaform and melamine.  
 ADVANTAGE - Little or no attrition occurs and **release**  
**control** is maintained even when the **coated**  
**particles** receive severe vibration and abrasion through repeated  
 rough handling. The mass of **particles** require no conditioning,  
 such as adding **diatomaceous earth**, to make them free  
 flowing and storage stable for long periods of time without agglomerating.

L47 ANSWER 13 OF 22 WPIX COPYRIGHT 2008 THE THOMSON CORP on STN  
 AN 1987-008520 [02] WPIX  
 DNC C1987-003212 [21]  
 DNN N1987-006180 [21]

TI **Coating** water soluble **granules** with water porous resin  
 - obtd. from **poly:isocyanate**, aromatic **poly:**  
**ol** hydroxylated plasticiser and opt. diluent and/or liquid amine  
 catalyst

DC A32; A97; C03; C04; P11; P42  
 IN KOEGLER H; KOGLER H; KUHLMANN P; WINTER R  
 PA (ASHL-C) ASHLAND OIL INC; (ASHL-N) ASHLAND-SUDCHEM KER; (ASHL-N)  
 ASHLAND-SUEDCHEMIE-KERNFEST GMBH

CYC 13  
 PIA DE 3544451 C 19870115 (198702)\* DE 6 <--  
 EP 230601 A 19870805 (198731) DE <--  
 JP 62144784 A 19870627 (198731) JA <--  
 US 4772490 A 19880920 (198840) EN 5 <--  
 ES 2000075 A 19871116 (198911) ES <--  
 EP 230601 B1 19921111 (199246) DE 9[0] <--  
 DE 3687118 G 19921217 (199252) DE <--  
 JP 07016648 B2 19950301 (199513) JA 5 <--  
 ADT DE 3544451 C DE 1985-3544451 19851216; DE 3687118 G DE  
 1986-3687118 19861215; EP 230601 A EP 1986-117434 19861215;  
 EP 230601 B1 EP 1986-117434 19861215; DE 3687118 G EP  
 1986-117434 19861215; JP 62144784 A JP 1986-296836 19861215  
 ; JP 07016648 B2 JP 1986-296836 19861215; US 4772490 A US  
 1986-942155 19861216  
 FDT DE 3687118 G Based on EP 230601 A; JP 07016648 B2 Based on JP 62144784 A  
 PRAI DE 1985-3544451 19851216

AB DE 3544451 C UPAB: 20060105

Process for **coating** water-soluble **granules** with a water-porous resin comprises treating the **granules** with a mixture of a **polyisocyanate** (pref. aromatic, e.g. **diisocyanatodiphenyl-methane**), a **polyol** obtd. by condensn. of phenols with aldehydes, a plasticiser containing an OH gp. (e.g. castor **oil** or polyetherpolyols), and opt. an OH-containing diluent (e.g. diacetone alcohol, BuOH or polyetherpolyols) and/or a liquid amine as catalyst. The **coated particles** are opt. treated with a gaseous amine, mixed with air or inert gases, to harden the **coating**.

USE - The process is especially applicable to fertilisers and **plant** protection agents, allowing a **controlled** and gradual **release** of the active components.

L47 ANSWER 14 OF 22 WPIX COPYRIGHT 2008 THE THOMSON CORP on STN

AN 1985-037841 [06] WPIX

DNC C1985-016347 [21]

TI Urethane **prepolymer** production and use in aggregate consolidation - by layering **poly:ol** over dense **poly:isocyanate** and reacting at interface

DC A25; A97; C03

IN DEDOLPH R R

PA (GRAV-N) GRAVI-MECHANICS CO

CYC 1

PIA US 4495310 A 19850122 (198506)\* EN 7[0]

<--

ADT US 4495310 A US 1981-262204 19810508; US 4495310 A US 1982-350946 19820222; US 4495310 A US 1983-493378 19830510

PRAI US 1983-493378 19830510

AB US 4495310 A UPAB: 20050422

Preparation of a urethane **prepolymer** (I) comprises adding a di- or **polyisocyanate** (II) to a polyether or polyester cpd. (III) under anhydrous conditions to initiate an exothermic condensation reaction. The temperature of (II) and (III) is such that the temperature after addition is at most 120

deg.C, and the density of (II) is greater than that of (III), addition being such that separate layers are formed. The reaction is then allowed to proceed to form (I).

(I) may be further reacted with water to form a cellular **polymer**, or with an aqueous-slurry of unconsolidated aggregate material to form a cellular **polymer** binding the aggregate. The **polymers** obtd. above are also claimed.

USE/ADVANTAGE - (I) is a viscous liquid with a high degree of crosslinking, leading to early setting after reaction with water. Low CO2 evolution occurs on reaction with water, giving a relatively low degree of expansion and consequently a low degree of foam shrinkage after reaction. When used to consolidate aggregate materials, the binding ability of the **polymer** is superior to that obtd. with **polymers** produced with mixing of (II) and (III), and no aging or curing of the **prepolymer** before reaction with water/aqueous slurry is required. Variation in **polymer** expansion and shrinkage is decreased and foams obtd. have increased strength after setting, as well as increased resistance to puncture and shear forces. A lower variation in pot life is shown by foams used for consolidation. The consolidated aggregate is useful e.g. as a plant **growth** supporting rooting medium.

L47 ANSWER 15 OF 22 WPIX COPYRIGHT 2008 THE THOMSON CORP on STN

AN 1984-013794 [03] WPIX

DNC C1984-005780 [21]

TI Pelletising agrochemicals or fertiliser - using binder obtd. from organic

**polyisocyanate** and polyethylene oxide  
 DC A97; C03; C04  
 IN TAKAO S; YAMADA Y; YAMAMOTO S  
 PA (NIPO-C) NIPPON POLYURETHANE KOGYO KK  
 CYC 1  
 PIA JP 58205536 A 19831130 (198403)\* JA 5[0] <--  
 ADT JP 58205536 A JP 1982-87269 19820525  
 PRAI JP 1982-87269 19820525  
 AB JP 58205536 A UPAB: 20050420  
 Method comprises using as binder an emulsion produced by mixing with water a self emulsification **isocyanate** produced by reaction of 100 weight% organic **polyisocyanate** and 1-20 weight% polyethyleneoxyd derivative of formula  $RO(CH_2CH_2O)_nH$ , or  $R(OCH_2CH_2)_mOOC.CH_2.COO(CH_2CH_2O)_nR'$  (where R and R' are each 1-4C alkyl; n and m is 5-120 in average).  
 The organic **polyisocyanate** is e.g., **trilenediisocyanate**, **diphenylmethanediisocyanate**, **polyphenylmethanepolyisocyanate**, **naphthylenediisocyanate**, **hexamethylenediisocyanate**, solution The polyethyleneoxyd derivative is e.g., methoxy polyethyleneglycol of mol. weight of respectively 300, 500, 700 and 900, and bis (methoxypolyethyleneoxy)malonate having molecular weight of respectively 500, 1500, and 2000, etc.  
 The aqueous emulsion of self emulsification type **polyisocyanate** cpd. is stable at normal temperature, and its viscosity remains constant for a long period thus forming uniform product. It enables mfr. of pellets in a short time without sticking of material. It has a high binding strength preventing the pellets formed from dusting. Its binding effect lasts a long time thus eliminating work for repeated application.

L47 ANSWER 16 OF 22 WPIX COPYRIGHT 2008 THE THOMSON CORP on STN  
 AN 1977-31919Y [18] WPIX  
 TI Coated granular fertiliser with long lasting action - using polyurethane **coating** obtd. from polyoxypropylene and **isocyanate**  
 DC A97; C04  
 PA (UBEI-C) UBE IND LTD  
 CYC 1  
 PIA JP 52038361 A 19770324 (197718)\* JA <--  
 JP 54039298 B 19791127 (197951) JA <--  
 ADT JP 52038361 A JP 1975-113607 19750922  
 AB JP 52038361 A UPAB: 20050417  
 Fertiliser is obtd. by **coating** a granular fertiliser opt. already **coated** with mineral substance and/or wax, with polyurethane layer. This is formed by reacting polyoxypropylene cpd. having a kinematic viscosity <4000 cP. (25 degrees C) or polyoxypropylene cpd. mixture whose kinematic viscosity is adjusted to <4000 cP (25 degrees C) with an **isocyanate** cpd.

L47 ANSWER 17 OF 22 WPIX COPYRIGHT 2008 THE THOMSON CORP on STN  
 AN 1975-44078W [26] WPIX  
 TI Horticultural foam structures - prepared by reacting NCO capped polyethylene oxide reactant and an aqueous reactant  
 DC A25; A35; A97; C03; P13  
 IN FRISCH K C; WOOD L L  
 PA (GRAC-C) GRACE & CO W R  
 CYC 2  
 PIA US 3889417 A 19750617 (197526)\* EN <--  
 CA 1012375 A 19770621 (197727) EN <--  
 ADT US 3889417 A US 1972-250012 19720503; US 3889417 A US 1972-279403 19720810; US 3889417 A US 1974-470492 19740516  
 PRAI US 1974-470492 19740516

AB US 3889417 A UPAB: 20051230

An improved crosslinked hydrophilic foam structures is prepared by reacting as continuous sheet, **isocyanate** capped polyoxyethylene **polyol** (I) having a reaction functionality >2 with an aqueous reactant (II) in the presence of a horti-cultural material the ratio of moles of water/moles NCO groups being 6.5-390 in (II) and (I) respectively. The foam sheet is useful as a carrier for pesticides, herbicides, seeds or the like. Supported foam sheet provides an effective means for protecting dormant seeds, for sustaining **seed** germination plant growth, **or** opt. for controlled **release** of pesticides and/or herbicides. These foams can be made biodegradable.

L47 ANSWER 18 OF 22 WPIX COPYRIGHT 2008 THE THOMSON CORP on STN

AN 1974-87182V [51] WPIX

TI Hydrophilic open-celled polyurethane foam - from high molecular weight trifunctional **polyol** and trialkanolamine

DC A25; C03; P13

PA (MONT-C) MONTEDISON SPA

CYC 6

PIA	BE 815682	A	19741129 (197451)*	FR	<--
	NL 7407077	A	19741203 (197451)	NL	<--
	DE 2425707	A	19750102 (197504)	DE	<--
	FR 2231704	A	19750131 (197512)	FR	<--
	GB 1466712	A	19770309 (197710)	EN	<--
	IL 44902	A	19770630 (197730)	EN	<--

PRAI IT 1973-24828 19730530

AB BE 815682 A UPAB: 20050414

Hydrophilic open-celled polyurethane foam, especially useful as a plant culturing substrate, is prepared by reacting (I) 10-50 pts. weight trifunctional **polyol** of the amino type, especially a trialkanolamine, (II) 50-90 pts. weight trifunctional **polyol** having a mol. weight of 500-3000, especially 1000, (III) 0-10 pts. weight **polyol** having a functionality of 2-6, and a mol. weight of less than 1000, (IV) 1-5 pts. weight water, (V) 0.1-2 pts. weight silicone surfactant, (VI) 0.1-5 pts. weight amino catalyst, (VII) 0-50 pts. weight lower halohydrocarbon blowing agent, and (VIII), an organic **isocyanate**, the NCO equivalent being 40-80% of the theoretical amount required to react with the active H atoms of the **polyols** and water.

L47 ANSWER 19 OF 22 WPIX COPYRIGHT 2008 THE THOMSON CORP on STN

AN 1974-58594V [33] WPIX

TI Hydrophilic open-cell polyurethane foams for plant culture - obtd from specified **polyols** reacted with limited amts. of **polyisocyanates**, giving improved water retention

DC A25; A97; C03; P13

IN JABS G; LOEW G; NIGGEMANN J

PA (FARB-C) BAYER AG

CYC 10

PIA	DE 2304892	A	19740808 (197433)*	DE	<--
	NL 7401205	A	19740805 (197433)	NL	<--
	BE 810367	A	19740730 (197434)	FR	<--
	FR 2216315	A	19741004 (197448)	FR	<--
	JP 49110798	A	19741022 (197452)	JA	<--
	AT 7400730	A	19751015 (197544)	DE	<--
	GB 1423075	A	19760128 (197605)	EN	<--
	US 3970618	A	19760720 (197631)	EN	<--
	IL 44107	A	19761130 (197651)	EN	<--
	CH 584726	A	19770215 (197716)	DE	<--

ADT DE 2304892 A DE 1973-2304892 19730201

AB DE 2304892 A UPAB: 20050414



The foams (I) are made from (A) a **polyol** or mixture with hydroxyl value of 900-1800; and (B) a **polyisocyanate** with polyurethane, urea, carbodiimide, allophanate, **isocyanurate** and for biuret gps. with aromatic bound NCO gps., in amount of 20-60% of the theoretical quantity to react with all active hydrogen atoms in the mixture (I) have a density of 6-30 kg m<sup>-3</sup> and after saturation and application of a suction of 30 cm water column, retain at ≥25 volume% of water. The foams are suitable for soil-less propagation of cuttings and **growth** of plants. They require less watering and after planting out show less tendency than known foams to dry out due to capillary attraction of moisture by the surrounding soil.

L47 ANSWER 20 OF 22 WPIX COPYRIGHT 2008 THE THOMSON CORP on STN  
 AN 1974-43240V [23] WPIX  
 TI Horticultural hydrophilic foam structures - for protecting dormant seeds etc. prepared from **isocyanate** capped polyoxyethylene **polyol** and aqueous reactant containing seeds  
 DC A25; A97; C03; P13  
 PA (GRAC-C) GRACE & CO W R  
 CYC 2  
 PIA US 3812619 A 19740528 (197423)\* EN <--  
 CA 1004872 A 19770208 (197708) EN <--  
 CA 1014766 A 19770802 (197733) EN <--  
 ADT US 3812619 A US 1972-250012 19720503; US 3812619 A US 1972-279403 19720810; US 3812619 A US 1974-470492 19740516  
 AB US 3812619 A UPAB: 20050414  
 Crosslinked, hydrophilic, horticultural foam structures having three-dimensional networks, are prepared by reacting an **isocyanate** capped polyoxyethylene **polyol** having a reaction functionality >2 with an aqueous reactant, the ratio moles H<sub>2</sub>O/moles NCO Being 6.5-390 (pref. 20-200), containing either horticultural material, seeds, bulbs or plants, desirably together with suitable nutrients, **fertilisers** and pesticides. Opt, a crosslinking agent may also be present. The **polyol moiety** has a mol. weight of 200-20,000, pref. 600-6,000 and OH functionality 2-6.

L47 ANSWER 21 OF 22 WPIX COPYRIGHT 2008 THE THOMSON CORP on STN  
 AN 1974-27725V [15] WPIX  
 TI Polyurethane foams contg **fertilizers** - foamed using alkaline hydro-xides and organotin cpds  
 DC A25; A97; C04  
 PA (KOKC-C); (KOKC-C) KOHKOKU CHEM IND CO LTD  
 CYC 1  
 PIA JP 48079899 A 19731026 (197415)\* JA <--  
 ADT JP 48079899 A JP 1972-10286 19720128  
 AB JP 48079899 A UPAB: 20050414  
 A foaming polyurethane compsn. containing **fertilizers** is mixed with alkali metal hydroxide or alkaline earth metal hydroxide and an organotin cpd. and foamed to give **fertilizer** containing polyurethane foam. In an example **powdered** com. (NH<sub>4</sub>)<sub>3</sub>PO<sub>4</sub> 500, **powdered** NaOH 10, TG 3000 (tri-functional polyether mol. weight 3000) 1000, sn octanoate 8, N-methylmorpholine 2, pentamethyl-diethylenetrimerine 3, L540 (foam controlling agent) 12, and water 35 g were mixed in that order, stirred 60 sec. and mixed with 450 g tolylene **diisocyanate** to give a foam without any difficulties.

L47 ANSWER 22 OF 22 WPIX COPYRIGHT 2008 THE THOMSON CORP on STN  
 AN 1967-04516G [00] WPIX  
 TI **Fertilizer**  
 DC C00

PA (SUNO-C) SUN OIL CO  
 CYC 1  
 PIA NL 6405905 A (196800)\* NL  
 PRAI US 1964- 19640527  
 AB NL 6405905 A UPAB: 20050412

**Fertilizer** contng. free urea, incorporated in a polyurethane foam.

Plant **nutrients**.

Unlike in prior-art urea-impregnated foams, the urea is completely and very thoroughly dispersed within the foam, thus affording a very **slow release** of the urea on leaching with water.

The polyurethane foams are prepared by reaction of a **diisocyanate** with one or more **polyols** to give **polymers**, the properties of which depend on the type of **polyols** used, straight **polyols** yielding soft foams and branched **polyols** yielding rigid foams. Halogenated hydrocarbons or H<sub>2</sub>O (in combination with **diisocyanate**) are used as blowing agents. The **polymerisation** reaction is catalysed by addition of a suitable catalyst, whereas finally an emulsifying agent or any other surfactant may be incorporated. The urea is added to the reaction mixture before the **polymerisation** takes place, using such a rate that the formation of the foam is not seriously impaired.

=> => fil hcaplus

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L134 ANSWER 1 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 2005:427778 HCAPLUS

DN 143:132599

TI **Slow-releasing compound fertilizer**  
 containing **particles** with polymer framework

IN Li, Zhong; Shi, Yuanliang; Zhang, Xudong

PA Shenyang Inst. of Applied Ecology, Chinese Academy of Sciences, Peop. Rep. China

SO Faming Zhuanli Shenqing Gongkai Shuomingshu, No pp. given

CODEN: CNXXEV

DT Patent

LA Chinese

FAN.CNT 1

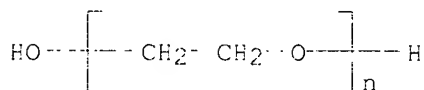
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	CN 1491925	A	20040428	CN 2003-111314	20030328 <--
PRAI	CN 2003-111314		20030328	<--	

AB The title **fertilizer** consists of **particles** (2-6 mm) with active ingredients dispersed in polymer framework (0.01-2 weight% of the compound **fertilizer**). The active ingredient are soluble N, P and K **fertilizers** at a weight ratio of N : P2O5 : K2O = 8-20 : 5-20 : 5-20. Expts. show that the title **fertilizer** has longer releasing period than normal **fertilizers**.

IT 25322-68-3, Polyethylene oxide  
 RL: AGR (Agricultural use); BIOL (Biological study); USES (Uses)  
 (slow-releasing compound **fertilizer** containing **particles** with polymer framework)

RN 25322-68-3 HCAPLUS

CN Poly(oxy-1,2-ethanedyl),  $\alpha$ -hydro- $\omega$ -hydroxy- (CA INDEX NAME)



L134 ANSWER 2 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 2005:323665 HCAPLUS

DN 142:391676

TI Coating for **fertilizer**

IN Whittington, Albert A.

PA USA

SO U.S. Pat. Appl. Publ., 9 pp.

CODEN: USXXCO

DT Patent

LA English

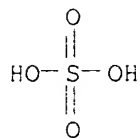
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2005076687	A1	20050414	US 2003-682347	20031010 <--
PRAI	US 2003-682347		20031010	<--	

AB Method and apparatus for coating **fertilizer** in pellet or other form to impart time-release characteristics, is given. A **polyurethane** coating **encapsulates fertilizer particles**, forming a hydrophobic coating for slow-release qualities. The **urethane** polymer coating is formulated with an **isocyanate** and a combined fluid of a polyether **polyol**, a **Me ester** derivative of **plant or vegetable oil**, a T-12 curing catalyst, barium sulfate, and an **oil-based dye**. The barium sulfate imparts phys. strength to and enhances color quality of the **polyurethane** coating, acts as a detackifier and maintains temperature in the coating reactor. The inventive formulation is effective in the practical polymer coating of sulfate-based or other **fertilizer** pellets in a time-release **fertilizer**. An apparatus is provided for carrying out the coating process.

IT 7727-43-7, Barium sulfate  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (**fertilizer** coating containing)

RN 7727-43-7 HCAPLUS  
 CN Sulfuric acid, barium salt (1:1) (CA INDEX NAME)



● Ba

IT **849765-90-8P**  
 RL: MOA (Modifier or additive use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
 (preparation as **fertilizer** coating)  
 RN 849765-90-8 HCAPLUS  
 CN Poly[oxy(methyl-1,2-ethanediyl)],  $\alpha$ -hydro- $\omega$ -hydroxy-, ether with 2-ethyl-2-(hydroxymethyl)-1,3-propanediol (3:1), polymer with Isonate 143L (9CI) (CA INDEX NAME)

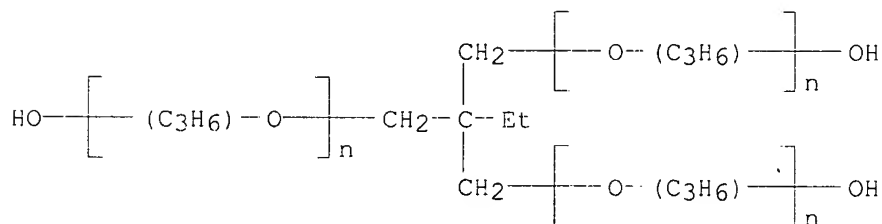
CM 1

CRN 39394-41-7  
 CMF Unspecified  
 CCI MAN

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

CM 2

CRN 25723-16-4  
 CMF (C3 H6 O)<sub>n</sub> (C3 H6 O)<sub>n</sub> (C3 H6 O)<sub>n</sub> C6 H14 O3  
 CCI IDS, PMS



L134 ANSWER 3 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN  
 AN 2005:231667 HCAPLUS  
 DN 142:297421  
 TI Blocking-resistant **granular fertilizers coated** with waxes and **polyurethanes**, and their manufacture  
 IN Tabei, Nobuaki  
 FA Sumitomo Chemical Co., Ltd., Japan  
 SO Jpn. Kokai Tokkyo Koho, 9 pp.  
 CODEN: JKXXAF  
 DT **Patent**

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2005067904	A	20050317	JP 2003-208184	20030821 <--
PRAI	JP 2003-208184		20030821 <--		

AB Title **fertilizers** are manufactured by **coating** wax-  
**coated granular fertilizers** with  
**polyurethanes** and **overcoating** with 0.01-0.2 weight% (in  
total, based on the **coated fertilizers**) hydrogenated  
oils and NaO<sub>3</sub>SO(CH<sub>2</sub>)<sub>11</sub>Me at 63-85°. Thus, urea **granules**  
were **coated** with (A) Hi-Mic 1045 (microcryst. wax), (B) a mixture  
of Sumidur 44V10 (polymeric MDI), Sumiphen TM (branched polyether-  
**polyol**), and 2,4,6-tris(dimethylaminomethyl)phenol, and (C) a  
mixture of hydrogenated rapeseed oil and Emal 10 (NaO<sub>3</sub>SO(CH<sub>2</sub>)<sub>11</sub>Me) in this  
order, and stored at 70° for 2 days and 25° for 4 days under  
500 g weight to show no blocking.

IT 57029-46-6P

RL: AGR (Agricultural use); SPN (Synthetic preparation); BIOL (Biological  
study); PREP (Preparation); USES (Uses)

(blocking-resistant **granular fertilizers**

**coated** with waxes, **polyurethanes**, and hydrogenated  
oil-Na lauryl sulfate mixture)

RN 57029-46-6 HCAPLUS

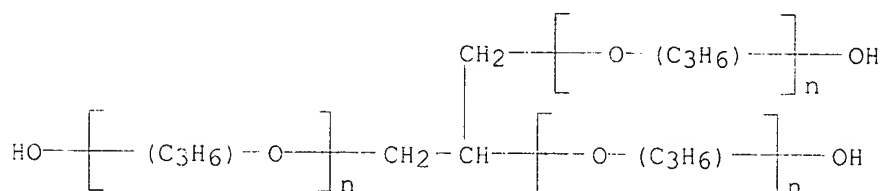
CN Isocyanic acid, polymethylenepolyphenylene ester, polymer with  
 $\alpha, \alpha', \alpha''$ -1,2,3-propanetriyltris[ $\omega$ -  
hydroxypoly[oxy(methyl-1,2-ethanediyl)]] (CA INDEX NAME)

CM 1

CRN 25791-96-2

CMF (C<sub>3</sub> H<sub>6</sub> O)<sub>n</sub> (C<sub>3</sub> H<sub>6</sub> O)<sub>n</sub> (C<sub>3</sub> H<sub>6</sub> O)<sub>n</sub> C<sub>3</sub> H<sub>8</sub> O<sub>3</sub>

CCI IDS, PMS



CM 2

CRN 9016-87-9

CMF Unspecified

CCI PMS, MAN

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

L134 ANSWER 4 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 2005:135590 HCAPLUS

DN 142:218450

TI **Polyurethane-coated nonfloating fertilizer**  
**granules**

IN Tabei, Nobuaki

PA Sumitomo Chemical Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

DT **Patent**

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2005041700	A	20050217	JP 2003-199654	20030722 <--
PRAI	JP 2003-199654		20030722	<--	

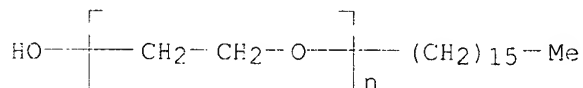
AB Title **granules** contain nonionic surfactants with HLB >10 to <16 and inorg. fine powders at 0.05-0.5 weight% (based on total weight) on the surface of the **coating** layer. Thus, **granular** urea was **coated** with Sumidur 44V10 (polymeric MDI), Sumiphen TM (branched polyether-**polyol**), and 2,4,6-tris(dimethylaminomethyl)phenol, cured, and **overcoated** with Pagnol O 16 (polyoxyethylene oleyl ether) and Tokuyuki Cut Clay to give nonfloating **coated granules**.

IT **9004-95-9**, Pagnol C 18 **9004-98-2**, Pagnol O 16  
 RL: AGR (Agricultural use); MOA (Modifier or additive use); BIOL (Biological study); USES (Uses)

(nonfloating **fertilizer granules coated**  
 with **polyurethanes**, surfactants, and inorg. fine  
**particles**)

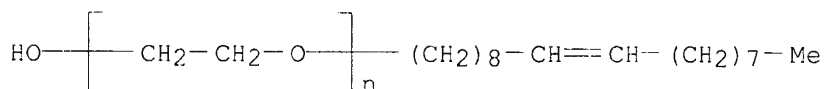
RN 9004-95-9 HCAPLUS

CN Poly(oxy-1,2-ethanediyl),  $\alpha$ -hexadecyl- $\omega$ -hydroxy- (CA INDEX NAME)



RN 9004-98-2 HCAPLUS

CN Poly(oxy-1,2-ethanediyl),  $\alpha$ -(9Z)-9-octadecen-1-yl- $\omega$ -hydroxy- (CA INDEX NAME)



IT **57029-46-6P**

RL: AGR (Agricultural use); SPN (Synthetic preparation); BIOL (Biological study); PREP (Preparation); USES (Uses)

(nonfloating **fertilizer granules coated**  
 with **polyurethanes**, surfactants, and inorg. fine  
**particles**)

RN 57029-46-6 HCAPLUS

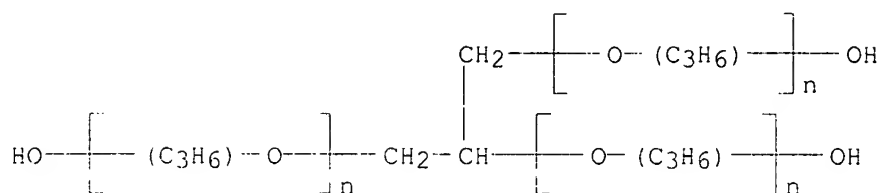
CN Isocyanic acid, polymethylenepolyphenylene ester, polymer with  $\alpha, \alpha', \alpha''$ -1,2,3-propanetriyltris( $\omega$ -hydroxypoly[oxy(methyl-1,2-ethanediyl)]) (CA INDEX NAME)

CM 1

CRN 25791-96-2

CMF (C3 H6 O)<sub>n</sub> (C3 H6 O)<sub>n</sub> (C3 H6 O)<sub>n</sub> C3 H8 O3

CCI 1DS, PMS



CM 2

CRN 9016-87-9  
 CMF Unspecified  
 CCI PMS, MAN

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

L134 ANSWER 5 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 2005:9504 HCAPLUS

DN 142:74019

TI Production of **granular fertilizer coated**  
 with polymers

IN Tabei, Nobuaki

PA Sumitomo Chemical Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 8 pp.

CODEN: JKXXAF

DT **Patent**

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2005001957	A	20050106	JP 2003-168921	20030613 <--
PRAI	JP 2003-168921		20030613	<--	

AB **Granular fertilizer is coated** with  
**polyurethane** film produced by the reaction of polyester  
**polyol** and **polyisocyanate**. The polyester **polyol**  
 may be hydrogenated castor oil, or combination of hydrogenated castor oil  
 and non-hydrogenated castor oil. The **coated granules**  
 are naturally degraded in the soil, the active agent is slowly released.

IT **75-13-8D, Isocyanic acid, polymers**

RL: RCT (Reactant); RACT (Reactant or reagent)  
 (production of **granular fertilizer coated**  
 with **polyurethane** made from)

RN 75-13-8 HCAPLUS

CN Isocyanic acid (6CI, 8CI, 9CI) (CA INDEX NAME)

HN=C=O

L134 ANSWER 6 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 2004:931641 HCAPLUS

DN 141:365761

TI **Urethane prepolymers for coating of granular**  
**fertilizers**, their manufacture, and the polymer-coated  
**granular fertilizers**

IN Tabei, Nobuaki

PA Sumitomo Chemical Co., Ltd., Japan  
 SO Jpn. Kokai Tokkyo Koho, 7 pp.  
 CODEN: JKXXAF

DT **Patent**

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2004307736	A	20041104	JP 2003-106151	20030410 <--
PRAI	JP 2003-106151		20030410	<--	

AB The prepolymers are manufactured by mixing **polyols** with amine-based catalysts and adding **polyisocyanates** to the mixts. A mixture containing Sumiphen TM (polyether **polyol**; OH value 372 mg/g) 141.8, Sumiphen 1600U (polyether **polyol**; OH value 115 mg/g) 69.2, and castor oil (OH value 161 mg/g) 42.5 g was stirred with 7.3 g 2,4,6-tris(dimethylaminomethyl)phenol at 25° for 30 min and then stirred with 9.7 g Sumidur 44V10 (polymeric MDI) to give a prepolymer, which was tumbled with a **granular urea fertilizer** at .apprx.70° and then with Tokuyuki Cut Clay (cut clay) and fine-powdered Na lauryl sulfate to give a **coated fertilizer**

IT **9016-87-9DP**, Sumidur 44V10, polyoxyalkylene-**polyurethanes**  
**25791-96-2DP**, Sumiphen TM, polyoxyalkylene-**polyurethanes**  
**57029-46-6P**, Sumidur 44V10-Sumiphen TM copolymer  
 RL: AGR (Agricultural use); IMF (Industrial manufacture); BIOL (Biological study); PREP (Preparation); USES (Uses)  
 (manufacture of **urethane** prepolymers for **coating** of **granular fertilizers**)

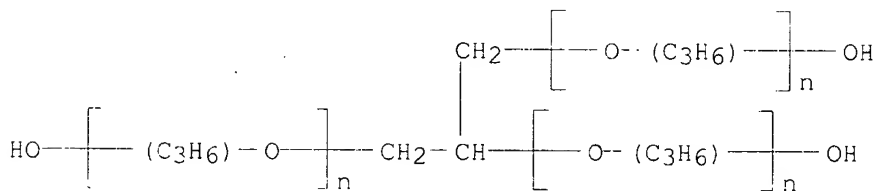
RN 9016-87-9 HCAPLUS

CN Isocyanic acid, polymethylenepolyphenylene ester (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

RN 25791-96-2 HCAPLUS

CN Poly[oxy(methyl-1,2-ethanediyl)],  $\alpha, \alpha', \alpha''$ -1,2,3-propanetriyltris[ $\omega$ -hydroxy- (CA INDEX NAME)]



RN 57029-46-6 HCAPLUS

CN Isocyanic acid, polymethylenepolyphenylene ester, polymer with  $\alpha, \alpha', \alpha''$ -1,2,3-propanetriyltris[ $\omega$ -hydroxypoly[oxy(methyl-1,2-ethanediyl)]] (CA INDEX NAME)

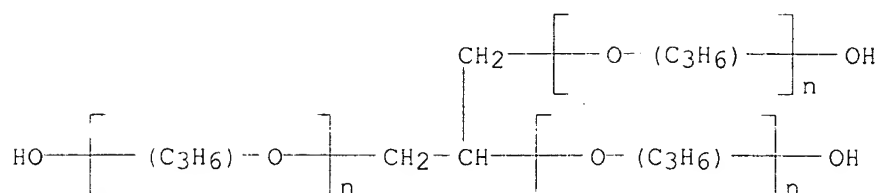
CM 1

CRN 25791-96-2

CMF (C3 H6 O)n (C3 H6 O)n (C3 H6 O)n C3 H8 O3

CCI IDS, PMS





CM 2

CRN 9016-87-9  
 CMF Unspecified  
 CCI PMS, MAN

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

L134 ANSWER 7 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 2004:651220 HCAPLUS

DN 141:156591

TI **Coated granules containing fertilizers**

IN Kuramochi, Hitoshi; Uchino, Masazumi

PA Chisso Corp., Japan

SO Jpn. Kokai Tokkyo Koho, 12 pp.

CODEN: JKXXAF

DT **Patent**

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2004224609	A	20040812	JP 2003-12112	20030121 <--
PRAI	JP 2003-12112		20030121	<--	

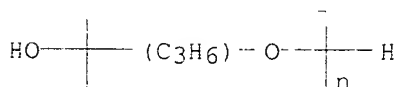
AB **Granules containing fertilizers are coated with polyurethane** (e.g., polypropylene glycol), and the strength of the **polyurethane** film is 7 to 11 MPa. The rate of the **release** of active agents from the **granules** is regulated and **controlled**. For example, for the first period after the **granules** are applied to the ground, the **release** of active compds. is held back, followed by the **releasing** period that lasts a **controlled** duration.

IT 25322-69-4, Polypropylene glycol

RL: AGR (Agricultural use); BIOL (Biological study); USES (Uses)  
 (coating polyurethanes for controlled-release fertilizer granules)

RN 25322-69-4 HCAPLUS

CN Poly[oxy(methyl-1,2-ethanediyl)],  $\alpha$ -hydro- $\omega$ -hydroxy- (CA  
 INDEX NAME)



L134 ANSWER 8 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 2004:588185 HCAPLUS

DN 141:123157

TI Production of **fertilizer granules coated**  
with **polyurethane**

IN Tabei, Nobuaki

PA Sumitomo Chemical Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 8 pp.

CODEN: JKXXAF

DT **Patent**

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2004203667	A	20040722	JP 2002-374040	20021225 <--
PRAI	JP 2002-374040		20021225 <--		

AB **Granular slow-release fertilizers**

with a **coating** that naturally disintegrates after dissoln. of the **fertilizer** component(s) are **coated** with a **polyurethane** formed by reacting a polyester-polyether **polyol** component and a **polyisocyanate** component at an NCO/OH equivalent ratio of 0.9-1.2. The mixed polyester-polyether **polyol** comprises hardened castor oil and a propylene oxide adduct of a C3-6 **polyhydric** alc. (weight ratio = 20:80-80:20). Thus, **granular** urea was **coated** with **urethane** resin obtained by blending a mixture of molten hardened castor oil and trimethylolpropane-propylene oxide adduct (OH value 372 mg KOH/g) with Sumidur 44V10 at a **coating** amount of 8%. The leaching rates for 2 **fertilizers** differing in amts. of hardened castor oil, **polyol**, and MDI used were 65% and 82% in 100 days.

IT **9016-87-9D**, Sumidur 44V10, reaction products with castor oil and propoxylated trimethylolpropane **25723-16-4D**, reaction products with castor oil and polymeric MDI

RL: AGR (Agricultural use); POF (Polymer in formulation); BIOL (Biological study); USES (Uses)

(production of **slow-release granular fertilizers coated with polyurethane**)

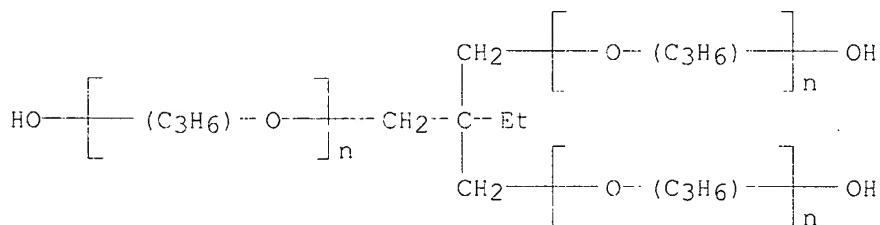
RN 9016-87-9 HCAPLUS

CN Isocyanic acid, polymethylenepolyphenylene ester (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

RN 25723-16-4 HCAPLUS

CN Poly[oxy(methyl-1,2-ethanediyl)],  $\alpha$ -hydro- $\omega$ -hydroxy-, ether with 2-ethyl-2-(hydroxymethyl)-1,3-propanediol (3:1) (CA INDEX NAME)



L134 ANSWER 9 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 2004:100310 HCAPLUS

DN 140:127726

TI **Controlled-release fertilizers** produced by **coating** nutrients with **polyurethanes** containing organic additives

IN Wynnyk, Nick P.; Stelmack, Eugene G.; Babiak, Nicolette M.; Carstens,  
 Leslie L.; Xing, Baozhong; Geiger, Albert J.; Eastham, J. David  
 PA Agrium, Can.  
 SO U.S. Pat. Appl. Publ., 14 pp.  
 CODEN: USXXCO  
 DT **Patent**  
 LA English  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2004020254	A1	20040205	US 2002-210177	20020802 <--
	CA 2436007	A1	20040202	CA 2003-2436007	20030725 <--
	US 2007137274	A1	20070621	US 2006-470059	20060905 <--
PRAI	US 2002-210177	A	20020802	<--	

AB A **controlled-release fertilizer** material  
 comprises a **particulate plant** nutrient surrounded by a  
**coating** comprising  $\geq 1$  substantially homogeneous layer of a  
**urethane**-containing compound and an organic additive. With appropriate  
 selection of the additive, the shape and duration of the **release**  
 profile can be modified to suit a wide variety of applications. Thus, 1  
 kg of urea **fertilizer** was **coated** with 3 layers, each  
 comprised of first applying a mixture of 1.20 g C30+ wax in 4.81 g  
**Soypolyol** 180 (a synthetic oleo **polyol** derived from  
 soybean **oil** and having an OH Value of 180) and 2.32 g of  
**isocyanate**. Six minutes was allowed between applications of each  
 layer, and the total **coat** weight was 2.5%. The product had a  
 relatively **slow**, linear N **release** curve in a water  
**release** test.

L134 ANSWER 10 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 2004:78179 HCAPLUS

DN 140:127724

TI **Controlled-release fertilizer** with improved  
 durability during handling and its production with **coating**  
 containing a **particulate** filler

IN Wynnyk, Nick P.; Stelmack, Eugene G.; Babiak, Nicolette M.; Carstens,  
 Leslie L.; Eastham, J. David; Xing, Baozhong

PA Can.

SO U.S. Pat. Appl. Publ., 13 pp.

CODEN: USXXCO

DT **Patent**

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2004016276	A1	20040129	US 2002-205490	20020726 <--
	CA 2493218	A1	20040205	CA 2003-2493218	20030725 <--
WO	2004011395	A1	20040205	WO 2003-CA1138	20030725 <--
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW				
RW:	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
AU	2003257288	A1	20040216	AU 2003-257288	20030725 <--
EP	1551783	A1	20050713	EP 2003-771026	20030725 <--

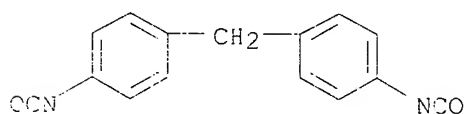
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,  
IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK

JP 2005533741 T 20051110 JP 2004-523696 20030725 <--  
US 2006032282 A1 20060216 US 2005-200006 20050810 <--  
US 2007169527 A1 20070726 US 2006-615785 20061222 <--  
PRAI US 2002-205490 A 20020726 <--  
WO 2003-CA1138 W 20030725 <--  
US 2005-200006 B1 20050810

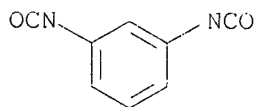
AB A **controlled-release fertilizer** material comprises a **particulate plant** nutrient surrounded by a protective **coating** comprising at least one substantially homogeneous layer of a **urethane**-containing compound and a filler(s). An organic additive(s) may or may not be present. Thus, urea was **coated** with 2 layers, applied 6 min apart, each comprised of a mixture of C30+ wax in castor **oil**, and **isocyanate**. Two further layers, each comprised of a urea dust-castor **oil** mixture and **isocyanate**, were applied in an **overcoat** application, and 6 min after application of the components of the 4th layer, the sample was cooled. Comparison of results from a paint shaker simulation with this **fertilizer** and comparative **fertilizer** with a **urethane coat** and wax layer showed that the mech. handling was improved by the function of the filler.

IT **101-68-8D**, Diphenylmethane **diisocyanate**, reaction products **26471-62-5D**, Toluene **diisocyanate**, reaction products  
RL: AGR (Agricultural use); PEP (Physical, engineering or chemical process); PYP (Physical process); BIOL (Biological study); PROC (Process); USES (Uses)  
(production of **controlled-release fertilizer** with improved durability by using **particulate** filler in **coating** of)

RN 101-68-8 HCAPLUS  
CN Benzene, 1,1'-methylenebis[4-isocyanato- (CA INDEX NAME)]



RN 26471-62-5 HCAPLUS  
CN Benzene, 1,3-diisocyanatomethyl- (CA INDEX NAME)



D1-Me

L134 ANSWER 11 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN  
AN 2003:685961 HCAPLUS  
DN 139:179430  
TI Production of **fertilizer granules coated**

with **urethane** polymers  
 IN Tabei, Nobuaki  
 PA Sumitomo Chemical Co., Ltd., Japan  
 SO Jpn. Kokai Tokkyo Koho, 9 pp.  
 CODEN: JKXXAF

DT **Patent**  
 LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2003246692	A	20030902	JP 2002-364773	20021217 <--
PRAI	JP 2001-387258	A	20011220	<--	

AB **Fertilizer granules** or **urethane** polymer-coated **fertilizer granules** are coated with a hydrofobic compound (e.g., wax and fatty acids) of m.p. or softening temperature 40 - 120°, **coating** at temperature higher than the m.p. or softening temperature described above, further **coated** with un-hardened **urethane** polymer (e.g., **polyisocyanate-polyol** reaction products) under the same temperature. These are **sustained-release fertilizers** useful even in tropical farming areas like those in south-east Asia.

IT 75-13-8D, **Isocyanic** acid, esters, polymers, reaction products with **polyols**

RL: NUU (Other use, unclassified); USES (Uses)  
 (in production of **fertilizer granules coated** with **urethane** polymers)

RN 75-13-8 HCAPLUS

CN Isocyanic acid (6CI, 8CI, 9CI) (CA INDEX NAME)

HN=C=O

L134 ANSWER 12 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 2003:503450 HCAPLUS

DN 139:64834

TI **Polyurethane-coated** bioactive substances, compositions containing them, and cultivation of crop using the **coated** substances or the compositions

IN Uchino, Masazumi

PA Chisso Corp., Japan

SO Jpn. Kokai Tokkyo Koho, 7 pp.

CODEN: JKXXAF

DT **Patent**

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2003183104	A	20030703	JP 2001-388247	20011220 <--
PRAI	JP 2001-388247		20011220	<--	

AB Claimed are bioactive substance **particles** such as agrochems. and **fertilizers coated** with **polyurethanes** prepared by reaction of (a) a mixture of **polyols** having OH equivalent  $\leq 120$  and **polyols** having OH equivalent  $\geq 150$  with (b) **isocyanates**. Also claimed are compns. containing the **coated particles** and **uncoated** bioactive substances and cultivation of crop using the **coated** substances or the compns. **Polyols** with different OH equivalent have a function to prolong dissoln. period and a function to increase water-holding capacity of the

bioactive substances, resp., so dissoln. rate and pattern. of the bioactive **particles** are easily **controlled** by the **polyurethanes**. Urea **granules** (920 g, average **particle** size 3.4 mm) were **coated** while feeding a mixture of propylene glycol (OH equivalent 38) 6.8, polypropylene glycol (OH equivalent 350) 35.3, and Me<sub>2</sub>NCH<sub>2</sub>CH<sub>2</sub>OH 0.8 g and 38 g polymeric MDI at 65-75° to give **coated** urea **granules**. **Coated granules** showed time-**release** characteristics. Application of the urea **granules** to cultivation of rice was also shown.

IT 9016-87-9DP, Polymeric MDI, polymers with polypropylene glycol triol and polypropylene glycol or tripropylene glycol 25322-69-4DP, Polypropylene glycol, polymers with polymeric MDI and polypropylene glycol triol 140236-64-2P 162743-76-2P  
 RL: AGR (Agricultural use); PNU (Preparation, unclassified); BIOL (Biological study); PREP (Preparation); USES (Uses)  
 (bioactive substances such as agrochemicals and **fertilizers** **coated** with **polyurethanes** prepared using 2 **polyols** with different OH equivalent for **controlled release**)

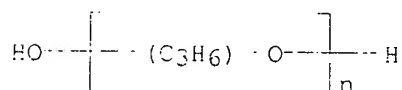
RN 9016-87-9 HCAPLUS

CN Isocyanic acid, polymethylenepolyphenylene ester (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

RN 25322-69-4 HCAPLUS

CN Poly[oxy(methyl-1,2-ethanediyl)], α-hydro-ω-hydroxy- (CA INDEX NAME)



RN 140236-64-2 HCAPLUS

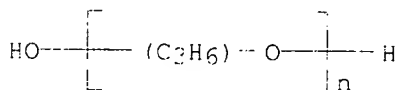
CN 1,2,3-Propanetriol, polymer with α-hydro-ω-hydroxypoly[oxy(methyl-1,2-ethanediyl)] and 1,1'-methylenebis[4-isocyanatobenzene] (9CI) (CA INDEX NAME)

CM 1

CRN 25322-69-4

CMF (C<sub>3</sub> H<sub>6</sub> O)<sub>n</sub> H<sub>2</sub> O

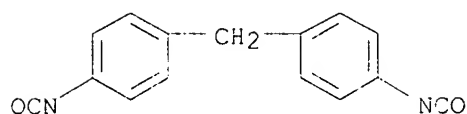
CCI IDS, PMS



CM 2

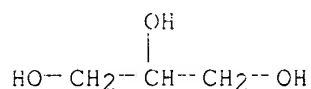
CRN 101-68-8

CMF C<sub>15</sub> H<sub>10</sub> N<sub>2</sub> O<sub>2</sub>



CM 3

CRN 56-81-5  
CMF C3 H8 O3

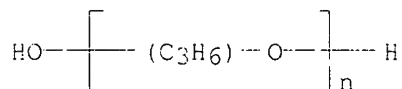


RN 162743-76-2 HCAPLUS

CN 1,2-Propanediol, polymer with α-hydro-ω-hydroxypoly[oxy(methyl-1,2-ethanediyl)] and 1,1'-methylenebis[4-isocyanatobenzene] (9CI) (CA INDEX NAME)

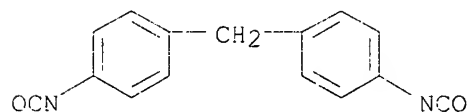
CM 1

CRN 25322-69-4  
CMF (C3 H6 O)<sub>n</sub> H2 O  
CCI IDS, PMS



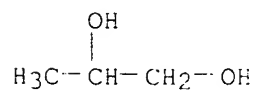
CM 2

CRN 101-68-8  
CMF C15 H10 N2 O2



CM 3

CRN 57-55-6  
CMF C3 H8 O2



L134 ANSWER 13 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN  
 AN 2003:454253 HCAPLUS  
 DN 139:6283  
 TI **Coated granular** agrochemicals  
 IN Winter, Reinhard; Priebe, Christian; Kuhlmann, Peter  
 PA Ashland Suedchemie-Kernfest Gmbh, Germany  
 SO PCT Int. Appl., 19 pp.  
 CODEN: PIXXD2  
 DT **Patent**  
 LA German  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE	
PI	WO 2003048075	A1	20030612	WO 2002-DE4352	20021127 <--	
	W:			AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW		
	RW:			GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG		
	DE 10158693	A1	20030626	DE 2001-10158693	20011129 <--	
	CA 2466531	A1	20030612	CA 2002-2466531	20021127 <--	
	AU 2002351700	A1	20030617	AU 2002-351700	20021127 <--	
	AU 2002351700	B2	20070913			
	EP 1451129	A1	20040901	EP 2002-787406	20021127 <--	
	EP 1451129	B1	20050713			
	R:			AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, SK		
	BR 2002014523	A	20041103	BR 2002-14523	20021127 <--	
	JP 2005511465	T	20050428	JP 2003-549270	20021127 <--	
	AT 299485	T	20050715	AT 2002-787406	20021127 <--	
	ES 2242079	T3	20051101	ES 2002-787406	20021127 <--	
	PT 1451129	T	20051130	PT 2002-787406	20021127 <--	
	US 2005005661	A1	20050113	US 2004-497196	20040527 <--	
	MX 2004PA05102	A	20050620	MX 2004-PA5102	20040527 <--	
PRAI	DE 2001-10158693	A	20011129	<--		
	WO 2002-DE4352	W	20021127	<--		

AB The invention relates to a **coated granular** agrochems., whereby the **coating** is a resin, comprising the reaction producing of at least one compound selected among cardol, cardanol or derivs. thereof or oligomers of these compds. with an **isocyanate**. Examples of agrochems. include **fertilizers, plant** protection agents, insecticides, pesticides, fungicides, drying agents and mixts. thereof. The substance **coated** according to the invention has advantageous properties since the resin can be applied in a specified and sparing manner to the substrates due to its low tendency to adhere. In particular, **coated fertilizer granules** are advantageous in that, with regard to the applied amount of **fertilizer**, they can provide more nutrients to the **plant**. In addition, **fertilizers** can be prepared that can provide nutrients to the **plant** over a longer period of time and continuously and they have an exact and reproducible release behavior according to the type of **plant** to be treated. The **polyol** constituents of the **coating** can be obtained from



the renewable raw material cashew nut oil.

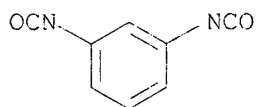
IT **26471-62-5, Toluenediisocyanate**

RL: RCT (Reactant); RACT (Reactant or reagent)

(cardol/cardanol precondensate from cashew oil as reactant with  
**isocyanates** for **coating granular**  
agrochems.)

RN 26471-62-5 HCAPLUS

CN Benzene, 1,3-diisocyanatomethyl- (CA INDEX NAME)



D1-Me

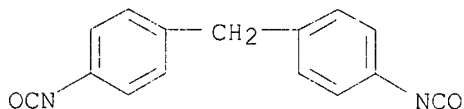
IT **101-68-8, Diphenylmethanediisocyanate**

RL: AGR (Agricultural use); BIOL (Biological study); USES (Uses)

(cardol/cardanol precondensate from cashew oil as reactant with  
**isocyanates** for **coating of**)

RN 101-68-8 HCAPLUS

CN Benzene, 1,1'-methylenebis[4-isocyanato- (CA INDEX NAME)



# RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Ashland Suedchemie Kern	1987			EP 0230601 A	HCAPLUS
Bayer Ag	2000			EP 0974568 A	HCAPLUS
Endo, K	2002			US 6358295 B1	HCAPLUS
Moore, W	2000			US 6045810 A	HCAPLUS

L134 ANSWER 14 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 2003:297634 HCAPLUS

DN 138:303495

TI **Fertilizer encapsulation** using sulfur containing  
**polyols**

IN Markusch, Peter H.; Cline, Robert L.

PA Bayer Corporation, USA

SO Eur. Pat. Appl., 18 pp.

CODEN: EPXXDW

DT **Patent**

LA English

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1302455	A1	20030416	EP 2002-22215	20021001 <--
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, SK				

US 2003089150	A1	20030515	US 2001-976610	20011012 <--
US 6617412	B2	20030909		
CA 2406412	A1	20030412	CA 2002-2406412	20021002 <--
JP 2003119092	A	20030423	JP 2002-297424	20021010 <--
MX 2002PA10000	A	20050816	MX 2002-PA10000	20021010 <--
PRAI US 2001-976610	A	20011012	<--	

AB This invention relates to **fertilizer encapsulation** with **polyurethanes** wherein the **isocyanate**-reactive composition contains sulfur. The process comprises applying a **polyisocyanate** composition to **fertilizer particles**, applying an **isocyanate**-reactive composition which contains sulfur to the **polyisocyanate coated fertilizer particles**, or applying an **isocyanate**-reactive composition which contains sulfur to **fertilizer particles** and then applying a **polyisocyanate** composition to the **isocyanate**-reactive **coated fertilizer particles**, and repeating these steps as necessary to form sulfur containing **polyurethane encapsulated fertilizer particles**.

IT 9016-87-9DP, reaction products with polypropylene glycol polyol derivs. and butanol 25322-69-4DP, polyol derivs., polymers with polymethylenepolyphenylene **isocyanate** 53862-89-8P 57047-34-4P 57214-08-1P 57214-09-2P 58718-85-7P 70520-26-2P

RL: MOA (Modifier or additive use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
(sulfur-containing; preparation as **coating for fertilizer encapsulation**)

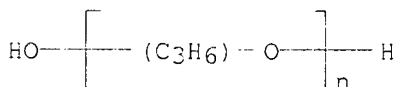
RN 9016-87-9 HCAPLUS

CN Isocyanic acid, polymethylenepolyphenylene ester (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

RN 25322-69-4 HCAPLUS

CN Poly[oxy(methyl-1,2-ethanediyl)],  $\alpha$ -hydro- $\omega$ -hydroxy- (CA INDEX NAME)



RN 53862-89-8 HCAPLUS

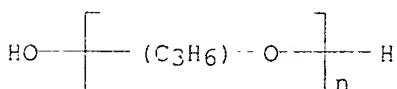
CN Isocyanic acid, polymethylenepolyphenylene ester, polymer with  $\alpha$ -hydro- $\omega$ -hydroxypoly[oxy(methyl-1,2-ethanediyl)] (CA INDEX NAME)

CM 1

CRN 25322-69-4

CMF (C3 H6 O)n H2 O

CCI IDS, PMS



CM 2

CRN 9016-87-9  
 CMF Unspecified  
 CCI PMS, MAN

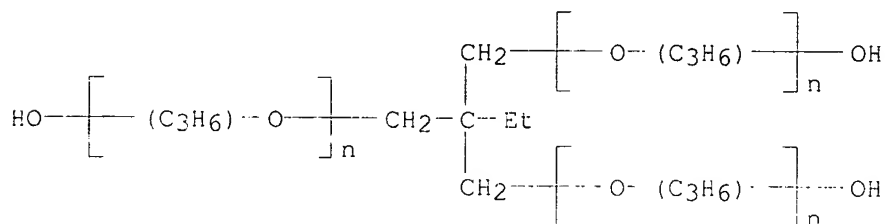
\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

RN 57047-34-4 HCAPLUS

CN Isocyanic acid, polymethylenepolyphenylene ester, polymer with  
 $\alpha$ -hydro- $\omega$ -hydroxypoly[oxy(methyl-1,2-ethanediyl)] ether with  
 2-ethyl-2-(hydroxymethyl)-1,3-propanediol (3:1) (9CI) (CA INDEX NAME)

CM 1

CRN 25723-16-4  
 CMF (C3 H6 O)<sub>n</sub> (C3 H6 O)<sub>n</sub> (C3 H6 O)<sub>n</sub> C6 H14 O3  
 CCI IDS, PMS



CM 2

CRN 9016-87-9  
 CMF Unspecified  
 CCI PMS, MAN

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

RN 57214-08-1 HCAPLUS

CN Isocyanic acid, polymethylenepolyphenylene ester, polymer with  
 2,2'-[1,2-ethanediylbis(oxy)]bis[ethanol] (CA INDEX NAME)

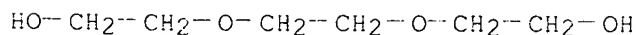
CM 1

CRN 9016-87-9  
 CMF Unspecified  
 CCI PMS, MAN

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

CM 2

CRN 112-27-6  
 CMF C6 H14 O4



RN 57214-09-2 HCAPLUS

CN Ethanol, 2,2'-oxybis-, polymer with polymethylenepolyphenylene isocyanate

(9CI) (CA INDEX NAME)

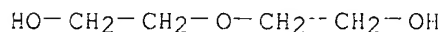
CM 1

CRN 9016-87-9  
 CMF Unspecified  
 CCI PMS, MAN

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

CM 2

CRN 111-46-6  
 CMF C4 H10 O3



RN 58718-85-7 HCAPLUS  
 CN Isocyanic acid, polymethylenepolyphenylene ester, polymer with  
 $\alpha$ -hydro- $\omega$ -hydroxypoly[oxy(methyl-1,2-ethanediyl)] ether with  
 $\beta$ -D-fructofuranosyl  $\alpha$ -D-glucopyranoside (CA INDEX NAME)

CM 1

CRN 9016-87-9  
 CMF Unspecified  
 CCI PMS, MAN

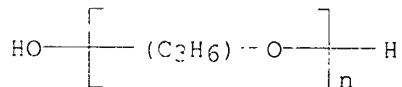
\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

CM 2

CRN 9049-71-2  
 CMF C12 H22 O11 . x (C3 H6 O)n H2 O

CM 3

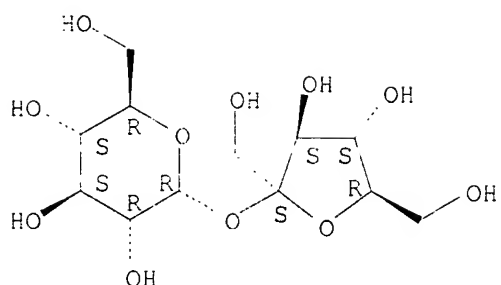
CRN 25322-69-4  
 CMF (C3 H6 O)n H2 O  
 CCI IDS, PMS



CM 4

CRN 57-50-1  
 CMF C12 H22 O11

Absolute stereochemistry.



RN 70520-26-2 HCAPLUS

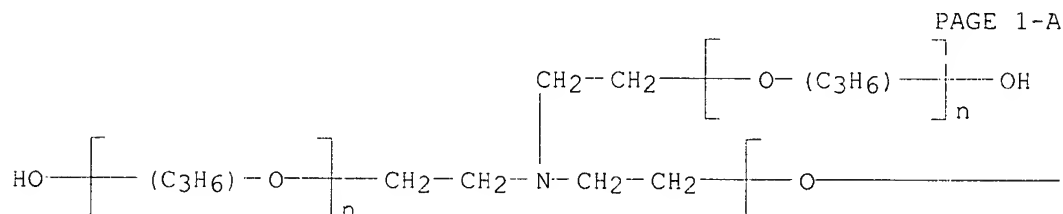
CN Isocyanic acid, polymethylenepolyphenylene ester, polymer with  $\alpha, \alpha', \alpha''$ -(nitrilotri-2,1-ethanediyl)tris[ $\omega$ -hydroxypoly[oxy(methyl-1,2-ethanediyl)]] (CA INDEX NAME)

CM 1

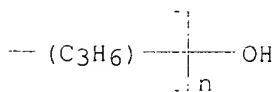
CRN 37206-53-0

CMF (C3 H6 O)<sub>n</sub> (C3 H6 O)<sub>n</sub> (C3 H6 O)<sub>n</sub> C6 H15 N O3

CCI IDS, PMS



PAGE 1-B



CM 2

CRN 9016-87-9

CMF Unspecified

CCI PMS, MAN

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Central Glass Co Ltd	1998			EP 0867422 A	HCAPLUS
Kamatant, Y	1983			US 4412072 A	HCAPLUS

Macnaughtan, D |2000 | | |US 6152981 A |HCAPLUS  
 Mitsubishi Chem Corp |1996 | | |JP 08225387 A |HCAPLUS

L134 ANSWER 15 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 2003:239788 HCAPLUS

DN 138:233406

TI Bioactive substances **coated** with **polyurethanes**,  
 compositions containing them, and crop cultivation using the  
**coated** products or the compositions

IN Uchino, Masazumi

PA Chisso Corp., Japan

SO Jpn. Kokai Tokkyo Koho, 7 pp.

CODEN: JKXXAF

DT **Patent**

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2003089605	A	20030328	JP 2001-281585	20010917 <--
PRAI	JP 2001-281585		20010917 <--		

AB Bioactive substances such as agrochems. and **fertilizers** are  
**coated** with **polyurethanes** prepared from reaction of  
 tripropylene glycol with **isocyanates**. The compns. contain the  
 above **coated** bioactive substances and **uncoated**  
 bioactive substances. The **coated** substances have very small  
 time-dependence of releasability and can be applicable for both  
 cultivation in greenhouses and using mulch films, where sudden increase in  
 temperature occurs, and cultivation in cold seasons. Urea **granules**  
 were **coated** by adding tripropylene glycol, 2,4,6-  
 tris(dimethylaminomethyl)phenol, and Sumidur 44V10 to give **coated**  
 urea **fertilizer**. Times for 80% dissoln. of the **coated**  
**granules** in H<sub>2</sub>O at 15, 25, and 35° were 90, 85, and 110  
 days, resp.

IT **9016-87-9DP**, Polymeric MDI, polymers with polypropylene glycol  
 diol or triol derivs. and tripropylene glycol **25322-69-4DP**,  
 Polypropylene glycol, diol or triol derivs., polymers with polymeric MDI  
 and tripropylene glycol **57288-55-8P**  
 RL: AGR (Agricultural use); SPN (Synthetic preparation); BIOL (Biological  
 study); PREP (Preparation); USES (Uses)

(bioactive substances **coated** with **polyurethanes**  
 comprising tripropylene glycol and **isocyanates** showing very  
 small temperature dependence in release behavior)

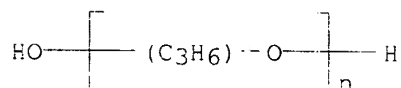
RN 9016-87-9 HCAPLUS

CN Isocyanic acid, polymethylenepolyphenylene ester (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

RN 25322-69-4 HCAPLUS

CN Poly[oxy(methyl-1,2-ethanediyl)],  $\alpha$ -hydro- $\omega$ -hydroxy- (CA  
 INDEX NAME)



RN 57288-55-8 HCAPLUS

CN Isocyanic acid, polymethylenepolyphenylene ester, polymer with  
 [(1-methyl-1,2-ethanediyl)bis(oxy)]bis[propanol] (CA INDEX NAME)

CM 1

CRN 24800-44-0  
 CMF C9 H2O O4  
 CCI IDS

$$\text{HO}-\text{CH}_2-\text{CH}_2-\text{O}-\text{CH}_2-\text{CH}_2-\text{O}-\text{CH}_2-\text{CH}_2-\text{OH}$$

3 ( D1-Me )

CM 2

CRN 9016-87-9  
 CMF Unspecified  
 CCI PMS, MAN

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

L134 ANSWER 16 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 2003:214647 HCAPLUS

DN 138:233417

TI Pesticide-containing **coated fertilizer granules** and their manufacture

IN Okada, Shoji

PA Sumitomo Chemical Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 8 pp.

CODEN: JKXXAF

DT **Patent**

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2003081705	A	20030319	JP 2001-276181	20010912 <--
PRAI	JP 2001-276181		20010912	<--	

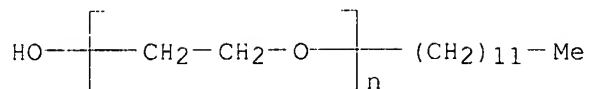
AB The **granules** comprise (a) agrochem. pesticide compds. and (b) oxyethylene compds. (d.p.  $\geq 10$ , melting at 35-100°) supported on **fertilizer granules coated** with thermosetting resins. The **granules** show **controlled initial release** of pesticides. (E)-(S)-1-(4-chlorophenyl)-4,4-dimethyl-2-(1H-1,2,4-triazol-1-yl)pent-1-en-3-ol was dissolved into PEG 4000N, mixed with N-P2O5-K2O **fertilizer granules**, and **coated** with a composition comprising Sumidur 44V10 (polymeric MDI), Sumiphen TM (polyether **polyol**), Sumiphen 1600U (polyether **polyol**), and an amine catalyst to give **coated granules**, which showed 93.0% stability of the active ingredient after storage at 40° for 3 days.

IT 9002-92-0, Polyoxyethylene lauryl ether

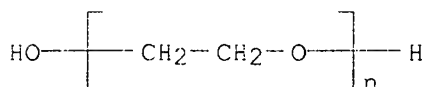
RL: AGR (Agricultural use); BIOL (Biological study); USES (Uses)  
 (Pegmol ST 15; **coated fertilizer granules**  
 containing pesticides and oxyethylene compds.)

RN 9002-92-0 HCAPLUS

CN Poly(oxy-1,2-ethanediyl),  $\alpha$ -dodecyl- $\omega$ -hydroxy- (CA INDEX  
 NAME)



IT 25322-68-3, Polyethylene glycol  
 RL: AGR (Agricultural use); BIOL (Biological study); USES (Uses)  
 (coated fertilizer granules containing  
 pesticides and oxyethylene compds.)  
 RN 25322-68-3 HCAPLUS  
 CN Poly(oxy-1,2-ethanediyl),  $\alpha$ -hydro- $\omega$ -hydroxy- (CA INDEX NAME)

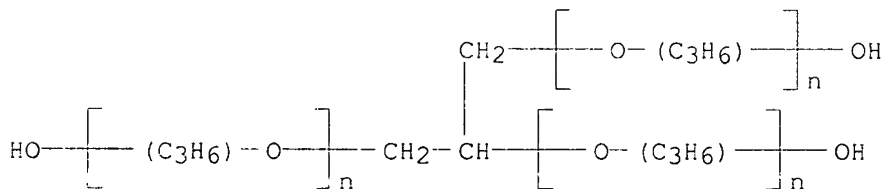


IT 198131-56-5  
 RL: AGR (Agricultural use); BIOL (Biological study); USES (Uses)  
 (coating; coated fertilizer  
 granules containing pesticides and oxyethylene compds.)  
 RN 198131-56-5 HCAPLUS  
 CN Isocyanic acid, polymethylenepolyphenylene ester, polymer with  
 $\alpha, \alpha', \alpha''$ -1,2,3-propanetriyltris[ $\omega$ -  
 hydroxypoly[oxy(methyl-1,2-ethanediyl)]] and Sumiphen 1600U (CA INDEX  
 NAME)  
 CM 1  
 CRN 198085-31-3  
 CMF Unspecified  
 CCI PMS, MAN

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

CM 2

CRN 25791-96-2  
 CMF (C3 H6 O)<sub>n</sub> (C3 H6 O)<sub>n</sub> (C3 H6 O)<sub>n</sub> C3 H8 O3  
 CCI IDS, PMS



CM 3

CRN 9016-87-9  
 CMF Unspecified  
 CCI PMS, MAN

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*



L134 ANSWER 17 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 2002:791970 HCAPLUS

DN 137:295796

TI **Microencapsulation with polyurethanes and(or) polyureas**

IN Podszun, Wolfgang; Krueger, Joachim; Probst, Joachim

PA Bayer AG, Germany

SO Ger. Offen., 8 pp.

CODEN: GWXXBX

DT **Patent**

LA German

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DE 10117784	A1	20021017	DE 2001-10117784	20010410 <--
	CA 2443682	A1	20021024	CA 2002-2443682	20020402 <--
	WO 2002033290	A1	20021024	WO 2002-EP3617	20020402 <--
	W:			AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW	
	RW:			GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG	
	AU 2002244761	A1	20021028	AU 2002-244761	20020402 <--
	EP 1379326	A1	20040114	EP 2002-712964	20020402 <--
	R:			AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR	
	BR 2002008797	A	20040309	BR 2002-8797	20020402 <--
	CN 1501837	A	20040602	CN 2002-808106	20020402 <--
	JP 2004535276	T	20041125	JP 2002-581087	20020402 <--
	US 2004115280	A1	20040617	US 2003-474123	20031006 <--
	MX 2003PA09229	A	20040129	MX 2003-PA9229	20031009 <--
PRAI	DE 2001-10117784	A	20010410	<--	
	WO 2002-EP3617	W	20020402	<--	

AB Highly stable **microcapsules** are manufactured by **encapsulation** of solid active substances in an aqueous dispersion in which  $\geq 1$  **polyisocyanate** is reacted with  $\geq 1$  **polyol** and(or) polyamine. Typical active substances are drugs, agrochems., perfumes, leucodyes, fireproofing agents, and adhesives.

IT **822-06-0DP, HDI, isocyanurate- and allophanate-containing****polyisocyanate, polymers with acrylic polyols**

RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)

(microencapsulation with polyurethanes and(or) polyureas of active substances)

RN 822-06-0 HCAPLUS

CN Hexane, 1,6-diisocyanato- (CA INDEX NAME)

OCN- (CH<sub>2</sub>)<sub>6</sub>-NCO

L134 ANSWER 18 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 2002:773610 HCAPLUS

DN 137:258841  
 TI Polymeric **coatings** for seeds or embryos  
 PA Incotec International B.V., Neth.  
 SO Eur. Pat. Appl., 24 pp.  
 CODEN: EPXXDW

DT **Patent**  
 LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1247436	A1	20021009	EP 2001-201213	20010402 <--
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
	WO 2002078421	A1	20021010	WO 2002-NL210	20020402 <--
	W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW				
	RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GE, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
	AU 2002246461	A1	20021015	AU 2002-246461	20020402 <--
FRAI	EP 2001-201213	A	20010402 <--		
	WO 2002-NL210	W	20020402 <--		

AB A method for **coating** seeds and/or embryos with a polymeric envelope is characterized by using an organic solvent in an essential anhydrous polymerization reaction. The polymeric envelope comprises at least one additive

selected from pesticides, plant growth regulators, fillers and **fertilizers**.

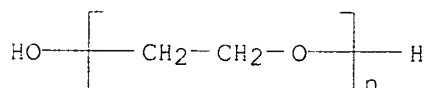
IT 25322-68-3D, Polyethylene glycol, reaction products with **isocyanates**

RL: AGR (Agricultural use); MOA (Modifier or additive use); BIOL (Biological study); USES (Uses)

(polymeric **coatings** for seeds or embryos comprising)

RN 25322-68-3 HCAPLUS

CN Poly(oxy-1,2-ethanediyl),  $\alpha$ -hydro- $\omega$ -hydroxy- (CA INDEX NAME)



# RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Charles, N	1988			US 4780987 A	
Ignace, G	1988			US 4735017 A	
Ignace, G	1991			US 5044116 A	
Keith, R	1986			US 4562663 A	
Porter, F	1974			US 3808740 A	HCAPLUS

L134 ANSWER 19 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 2002:47546 HCAPLUS

DN 136:101836

TI **Slow-release polyurethane-**

**encapsulated fertilizer** produced by process using oleo  
**polyols**

IN Markusch, Peter H.; Cline, Robert L.; Sarpeshkar, Ashok M.

PA Bayer Corporation, USA

SO Eur. Pat. Appl., 10 pp.

CODEN: EPXXDW

DT **Patent**

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1172347	A2	20020116	EP 2001-114816	20010627 <--
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	US 6358296	B1	20020319	US 2000-613680	20000711 <--
	CA 2352442	A1	20020111	CA 2001-2352442	20010705 <--
	MX 2001PA06872	A	20020806	MX 2001-PA6872	20010705 <--
	JP 2002114591	A	20020416	JP 2001-207716	20010709 <--
PRAI	US 2000-613680	A	20000711	<--	

AB **Polyurethane-encapsulated fertilizer**

**particles** which exhibit **slow-release**

properties are produced by a process comprising (1) applying an

**isocyanate**-reactive component or a **polyisocyanate**

component to **fertilizer particles**, to form

**coated fertilizer particles**, followed by (2)

applying a **polyisocyanate** component or an **isocyanate**

-reactive component onto the **coated fertilizer**

**particles** to form **polyurethane-encapsulated**

**fertilizer particles**, and, optionally, repeating these

steps as many times as necessary to form **polyurethane-**

**encapsulated fertilizer particles** that contain

about 2 to 20% by weight of **polyurethane**, based on the total weight of  
the **encapsulated fertilizer particles**.

Alternatively, the **isocyanate**-reactive component and the

**polyisocyanate** component can be premixed prior to being applied to

the **fertilizer particles** to form **polyurethane**

-**encapsulated fertilizer particles**.

Suitable **isocyanate**-reactive components comprise oleochem.

**polyols**. Thus, when urea pellets (100 g) were

**encapsulated** with Sovermol 815 (1.36 g) and a

polymethylenepolyphenylene **isocyanate** (0.72 g) with Dabco T-12

(0.0027 g) as catalyst to achieve 5.16% **polyurethane**

**encapsulation**, 30.16% of the urea dissolved after 8 h in water,

whereas 90.2% of urea dissolved from **uncoated** pellets.

IT **9016-87-9D**, polymers with castor oil **58718-85-7**

RL: AGR (Agricultural use); PEP (Physical, engineering or chemical

process); PYP (Physical process); BIOL (Biological study); PROC (Process);

USES (Uses)

(**slow-release polyurethane-**

**encapsulated fertilizer** production with oleochem.

**polyols**)

RN **9016-87-9** HCAPLUS

CN Isocyanic acid, polymethylenepolyphenylene ester (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

RN **58718-85-7** HCAPLUS

CN Isocyanic acid, polymethylenepolyphenylene ester, polymer with

$\alpha$ -hydro- $\omega$ -hydroxypoly[oxy(methyl-1,2-ethanediyl)] ether with

$\beta$ -D-fructofuranosyl  $\alpha$ -D-glucopyranoside (CA INDEX NAME)

CM 1

CRN 9016-87-9  
 CMF Unspecified  
 CCI PMS, MAN

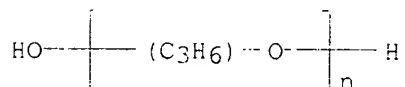
\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

CM 2

CRN 9049-71-2  
 CMF C12 H22 O11 . x (C3 H6 O)n H2 O

CM 3

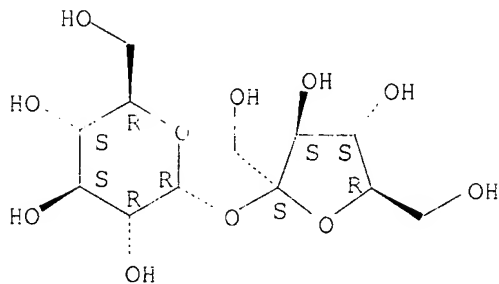
CRN 25322-69-4  
 CMF (C3 H6 O)n H2 O  
 CCI IDS, PMS



CM 4

CRN 57-50-1  
 CMF C12 H22 O11

Absolute stereochemistry.



L134 ANSWER 20 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 2002:10393 HCAPLUS

DN 136:53219

TI **Controlled-release coated fertilizer**

IN Geiger, Albert J.; Stelmack, Eugene G.; Babiak, Nicolette M.

PA Agrium Inc., Can.

SO PCT Int. Appl., 23 pp.

CODEN: PIXXD2

DT **Patent**

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2002000573	A2	20020103	WO 2001-CA923	20010627 <--

WO 2002000573 A3 20020801  
 W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW  
 RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG  
 US 6663686 B1 20031216 US 2000-604161 20000627 <--  
 CA 2412532 A1 20020103 CA 2001-2412532 20010627 <--  
 CA 2412532 C 20080122  
 EP 1299323 A2 20030409 EP 2001-944843 20010627 <--  
 R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR  
 JP 2004501855 T 20040122 JP 2002-505324 20010627 <--  
 US 2004045331 A1 20040311 US 2003-659432 20030911 <--  
 PRAI US 2000-604161 A 20000627 <--  
 WO 2001-CA923 W 20010627 <--

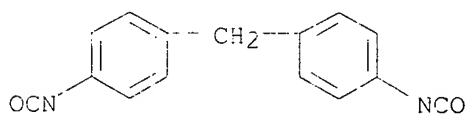
AB A **controlled release fertilizer** comprising a **particulate** plant nutrient surrounded by a **coating** which is the reaction product of a mixture comprising a **polyol**, an **isocyanate** and an organic wax.

IT 101-68-8D, Diphenylmethane **diisocyanate**, reaction products with **polyols** and organic waxes 26471-62-5D, Toluene **diisocyanate**, reaction products with **polyols** and organic waxes

RL: MOA (Modifier or additive use); USES (Uses)  
 (controlled-release coated fertilizer)

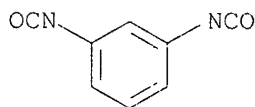
RN 101-68-8 HCAPLUS

CN Benzene, 1,1'-methylenebis[4-isocyanato- (CA INDEX NAME)



RN 26471-62-5 HCAPLUS

CN Benzene, 1,3-diisocyanatomethyl- (CA INDEX NAME)



D1-Me

L134 ANSWER 21 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 2001:855712 HCAPLUS

DN 135:357452

TI Coating of **fertilizer granules** containing

polymeric water-absorbents  
 IN Tabei, Nobuaki; Saito, Noriaki; Endo, Kazuhisa  
 PA Sumitomo Chemical Co., Ltd., Japan  
 SO Jpn. Kokai Tokkyo Koho, 7 pp.  
 CODEN: JKXXAF

DT Patent  
 LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2001328891	A	20011127	JP 2001-66313	20010309 <--
	US 6358295	B1	20020319	US 2001-798905	20010306 <--
FRAI	JP 2000-72015	A	20000315	<--	

AB A highly water-absorbing substance is added to **fertilizer granules**, and these **granules** are **coated** with  $\geq 1$  layer with **urethane** polymers. The **fertilizer** produces little residues floating on the surface of water when it is applied to flooded rice paddies. It releases active **fertilizer** components in a short time. The absorbents are, for example, acrylic polymers, isobutylene polymers, and starch derivs.

IT 9003-11-6, Ethylene oxide-propylene oxide copolymer

25322-68-3, Ethylene oxide polymer 25322-68-3D,

Poly(ethylene oxide), derivs. 25322-69-4

RL: AGR (Agricultural use); BIOL (Biological study); USES (Uses)

(coating of **fertilizer granules** containing polymeric water-absorbents)

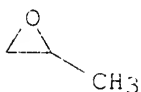
RN 9003-11-6 HCAPLUS

CN Oxirane, 2-methyl-, polymer with oxirane (CA INDEX NAME)

CM 1

CRN 75-56-9

CMF C3 H6 O



CM 2

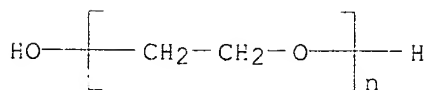
CRN 75-21-8

CMF C2 H4 O

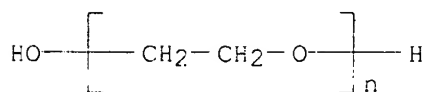


RN 25322-68-3 HCAPLUS

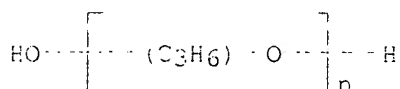
CN Poly(oxy-1,2-ethanediyl),  $\alpha$ -hydro- $\omega$ -hydroxy- (CA INDEX NAME)



RN 25322-68-3 HCAPLUS  
 CN Poly(oxy-1,2-ethanediyl),  $\alpha$ -hydro- $\omega$ -hydroxy- (CA INDEX NAME)



RN 25322-69-4 HCAPLUS  
 CN Poly[oxy(methyl-1,2-ethanediyl)],  $\alpha$ -hydro- $\omega$ -hydroxy- (CA INDEX NAME)



L134 ANSWER 22 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 2001:432906 HCAPLUS

DN 135:47219

TI **Polyurethane encapsulated fertilizer** having improved **slow-release** properties

IN Markusch, Peter H.; Cline, Robert L.; Sarpeshkar, Ashok M.; Yeater, Robert P.

PA Bayer Corporation, USA

SO Eur. Pat. Appl., 19 pp.

CODEN: EPXXDW

DT **Patent**

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1106635	A2	20010613	EP 2000-125299	20001128 <--
	EP 1106635	A3	20011219		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	US 6364925	B1	20020402	US 1999-458818	19991210 <--
	CA 2327736	A1	20010610	CA 2000-2327736	20001206 <--
	JP 2001213685	A	20010807	JP 2000-372789	20001207 <--
PRAI	US 1999-458818	A	19991210	<--	

AB The present invention relates to **polyurethane encapsulated fertilizer particles** which exhibit **slow-release** properties and to a process for their production. The process comprises applying an **isocyanate**-reactive component to **fertilizer particles**, to form **fertilizer particles coated** with an **isocyanate**-reactive component, applying a **polyisocyanate** component onto the **coated fertilizer particles** to form **polyurethane encapsulated fertilizer particles**, and, optionally, repeating these steps as many times as necessary to form the **polyurethane encapsulated fertilizer particles** that contain about 2-20% by weight of **polyurethane**, based on the total weight of the **encapsulated fertilizer particles**. Suitable **isocyanate**-reactive components include polyesterether **polyols** that comprise either a blend of or the reaction product of (i) castor oil having an OH number of about 160-170, a viscosity of about 500-900

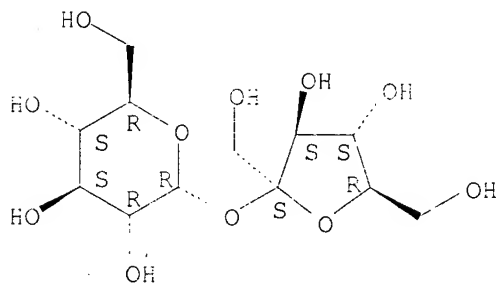
mPa·s at 25°, and a water content of less than 0.5% by weight; and (iii) a polyether **polyol** having an OH number 28-700, a functionality 3-8, and a mol. weight of about 240-6,000, and a viscosity about 50-35,000 mPa·s at 25°. The polyether **polyol** must be prepared from a suitable initiator compound and an alkylene oxide comprising at least 70% by weight of PEO.

IT 57-50-1DP, Sucrose, **polyetherpolyol**, polymers with **polyetherpolyol**, urea and polymethylene **polyphenylisocyanate** 75-56-9DP, Propylene oxide, **polyetherpolyol**, polymers with **polyetherpolyol**, urea and polymethylene **polyphenylisocyanate** 9016-87-9DP, Polymethylene **polyphenylisocyanate**, polymers with **polyetherpolyol** and urea 9051-49-4DP, Propoxylatedpentaerythritol, reaction products wit castor oil, polymers with **polyetherpolyol**, urea and polymethylene **polyphenylisocyanate** 25723-16-4DP, Propoxylated trimethylolpropane, reaction products wit castor oil, polymers with **polyetherpolyol**, urea and polymethylene **polyphenylisocyanate** 37208-53-0DP, Propoxylated triethanolamine (3:1), polymers with **polyetherpolyol**, urea and polymethylene **polyphenylisocyanate** 52625-13-5DP, Propoxylated sorbitol, reaction products wit castor oil, polymers with **polyetherpolyol**, urea and polymethylene **polyphenylisocyanate**  
 RL: AGR (Agricultural use); IMF (Industrial manufacture); BIOL (Biological study); PREP (Preparation); USES (Uses)  
 (polyurethane-encapsulated fertilizer  
 having improved slow-release properties)

RN 57-50-1 HCAPLUS

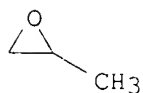
CN  $\alpha$ -D-Glucopyranoside,  $\beta$ -D-fructofuranosyl (CA INDEX NAME)

Absolute stereochemistry.



RN 75-56-9 HCAPLUS

CN Oxirane, 2-methyl- (CA INDEX NAME)



RN 9016-87-9 HCAPLUS

CN Isocyanic acid, polymethylenepolyphenylene ester (CA INDEX NAME)

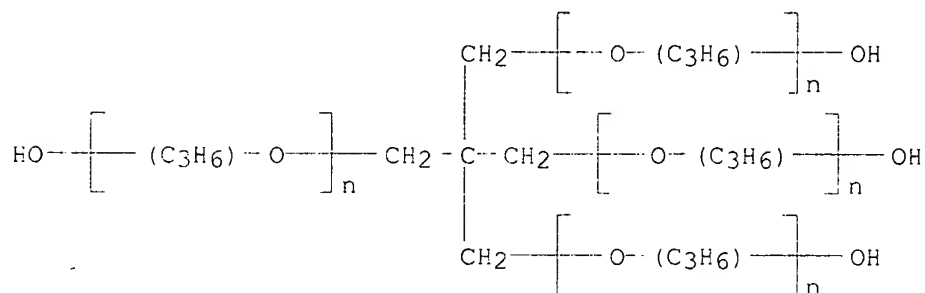
\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

RN 9051-49-4 HCAPLUS

CN Poly[oxy(methyl-1,2-ethanediyl)],  $\alpha$ -hydro- $\omega$ -hydroxy-, ether

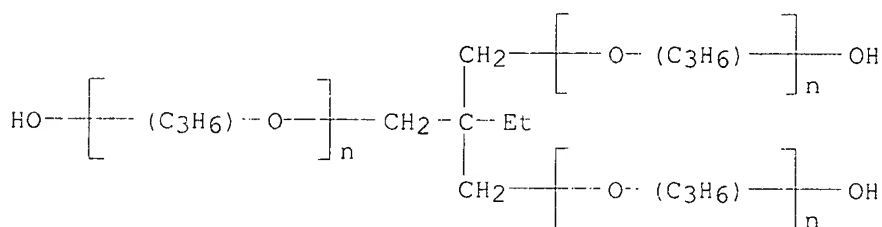


with 2,2-bis(hydroxymethyl)-1,3-propanediol (4:1) (CA INDEX NAME)



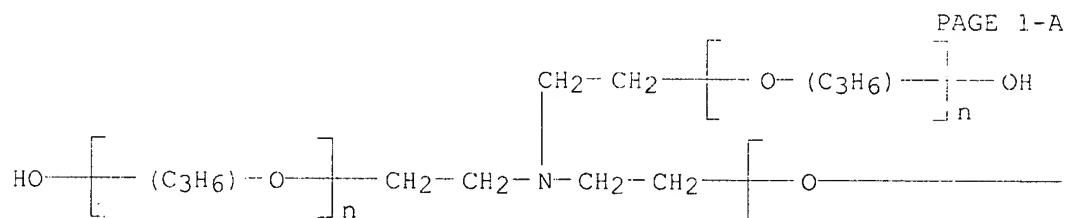
FN 25723-16-4 HCAPLUS

CN Poly[oxy(methyl-1,2-ethanediyl)],  $\alpha$ -hydro- $\omega$ -hydroxy-, ether  
with 2-ethyl-2-(hydroxymethyl)-1,3-propanediol (3:1) (CA INDEX NAME)



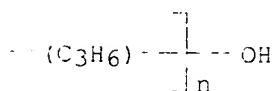
RN 37208-53-0 HCAPLUS

CN Poly[oxy(methyl-1,2-ethanediyl)],  $\alpha, \alpha', \alpha''$ -(nitrilotri-  
2,1-ethanediyl)tris[ $\omega$ -hydroxy- (CA INDEX NAME)]



PAGE 1-A

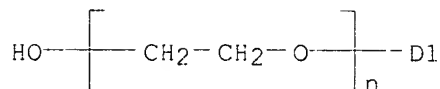
PAGE 1-B



RN 52625-13-5 HCAPLUS

CN Poly[oxy(methyl-1,2-ethanediyl)],  $\alpha$ -hydro- $\omega$ -hydroxy-, ether  
with D-glucitol (6:1) (CA INDEX NAME)





D1 = (CH<sub>2</sub>)<sub>8</sub>-Me

L134 ANSWER 24 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 2000:106847 HCAPLUS

DN 132:151198

TI Thermosetting resin-coated controlled-release  
granular fertilizers and their manufacture

IN Hirano, Yasuhiro; Yamaguchi, Hiroshi; Nakamura, Hiroshi

PA Sumitomo Chemical Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 8 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2000044377	A	20000215	JP 1999-140293	19990520 <--
	US 6231633	B1	20010515	US 1999-313985	19990519 <--
	CA 2272480	A1	19991122	CA 1999-2272480	19990520 <--
	AU 9930152	A	19991202	AU 1999-30152	19990520 <--
	AU 745527	B2	20020321		
PRAI	JP 1998-141549	A	19980522	<--	

AB The granular fertilizers coated with thermosetting resins and containing hydrophobic compds. in the fertilizer parts and/or coating layers, are manufactured Urea granules coated with 6 weight% (based on urea) polyurethane from polymeric MDI (Sumidur 44V10) and a branched polyether polyol (Sumiphen TM) mixed with 5 parts (based on 100 parts polymer) polyethylene wax (Neowax CL 70) showed 72% release of urea in H<sub>2</sub>O at 25° within 174 days.

IT 57029-46-6P

RL: AGR (Agricultural use); PNU (Preparation, unclassified); BIOL (Biological study); PREP (Preparation); USES (Uses)  
(thermosetting resin-coated controlled-release granular fertilizers containing hydrophobic compds.)

RN 57029-46-6 HCAPLUS

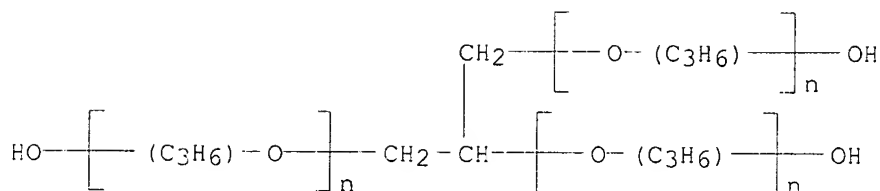
CN Isocyanic acid, polymethylenepolyphenylene ester, polymer with  $\alpha, \alpha', \alpha''$ -1,2,3-propanetriyltris[ $\omega$ -hydroxypoly[oxy(methyl-1,2-ethanediyl)]] (CA INDEX NAME)

CM 1

CRN 25791-96-2

CMF (C3 H6 O)<sub>n</sub> (C3 H6 O)<sub>n</sub> (C3 H6 O)<sub>n</sub> C3 H8 O3

CCI IDS, PMS



CM 2

CRN 9016-87-9

CMF Unspecified

CCI PMS, MAN

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

L134 ANSWER 25 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 2000:19396 HCAPLUS

DN 132:65506

TI Biodegradable **polyurethane coating** materials and water-soluble or -absorbing solids having the **coatings**

IN Hatakeyama, Hyoe; Hirose, Shigeo

PA Agency of Industrial Sciences and Technology, Japan

SO Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

DT **Patent**

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2000001646	A	20000107	JP 1998-181650	19980612 <--
	JP 3163540	B2	20010508		
FRA	JP 1998-181650		19980612 <--		

AB The materials, useful as **coatings** for **fertilizers**, fabrics, etc., contain **urethane** prepolymers (d.p. 10-90) manufactured from **polyisocyanates** and **polyhydric** alcs. containing 0.5-90% molasses and/or sugars. Thus, polyethylene glycol containing 13% molasses was polymerized with crude MDI, applied to a glass substrate, and cured to give a film showing Tg 49.5°, thermal decomposition temperature 310.1°, and degradability on treating with lipase.

IT **57636-09-6P**, Crude MDI-polyethylene glycol copolymer  
 RL: AGR (Agricultural use); IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); BIOL (Biological study); PREP (Preparation); USES (Uses)  
 (biodegradable **coatings** containing **polyurethanes** containing molasses or sugars)

RN 57636-09-6 HCAPLUS

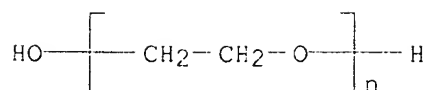
CN Isocyanic acid, polymethylenepolyphenylene ester, polymer with  $\alpha$ -hydro- $\omega$ -hydroxypoly(oxy-1,2-ethanediyl) (CA INDEX NAME)

CM 1

CRN 25322-68-3

CMF (C2 H4 O)<sub>n</sub> H2 O

CCI PMS



CM 2

CRN 9016-87-9  
 CMF Unspecified  
 CCI PMS, MAN

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

L134 ANSWER 26 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 1999:330964 HCAPLUS

DN 131:33059

TI Synthetic resin-based films with **coating** layers for agricultural covering materials

IN Takano, Tadahiro; Machida, Toshimi

PA Achilles Corp., Japan

SO Jpn. Kokai Tokkyo Koho, 8 pp.

CODEN: JKXXAF

DT **Patent**

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 11137097	A	19990525	JP 1997-330968	19971114 <--
PRAI	JP 1997-330968		19971114	<--	

AB Title films consist of synthetic resin-based supports and weather-resistant and antifogging surface layers containing water-thinned **coatings**, colloidal silica having average **particle** diameter 1-200 nm, hindered amine emulsions, and silicone-type surfactants on  $\geq 1$  side. The films show lasting weatherability and antifogging effect in use as covering materials for agriculture, e.g., greenhouse. Thus, a PVC film was gravure-**coated** with a composition of **polyurethane** emulsion (Bon-Tighter HUX 232) 100, colloidal silica 100, hindered amine emulsion (Sanduvor 3051) 2, a crosslinking agent (Bon-Tighter UUX-XW 2) 6, and a silicone-type surfactant (NUC Silicone L 77) 0.1 part and dried at 90° for 1 min to give title film showing retention of antifogging effect in 12-mo use as greenhouse covering.

IT **9016-45-9**, Polyethylene glycol nonylphenyl ether

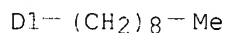
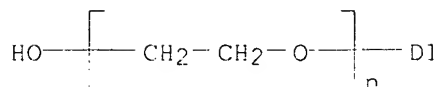
RL: MOA (Modifier or additive use); USES (Uses)

(synthetic resin films with weather-resistant antifogging water-thinned **coatings** for agricultural covering materials)

RN 9016-45-9 HCAPLUS

CN Poly(oxy-1,2-ethanediyl),  $\alpha$ -(nonylphenyl)- $\omega$ -hydroxy- (CA

INDEX NAME)



L134 ANSWER 27 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 1999:267316 HCAPLUS

DN 130:296139

TI **Controlled-release fertilizers** and  
**fertilization** using them

IN Ando, Seinosuke; Yoshiwara, Hideo

PA Coop Chemical Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 7 pp.

CODEN: JKXXAF

DT **Patent**

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 11116372	A	19990427	JP 1997-299680	19971017 <--
PRAI	JP 1997-299680		19971017	<--	

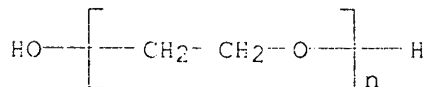
AB The **fertilizers** are wrapped with molded products comprising microporous materials or **coating** materials for **controlled release**. Also claimed is a **fertilization** method by directly applying the **fertilizers** to field, e.g. paddy, pasture, protected horticulture field, etc. A **polyurethane-coated** waterproof nylon fabric sheet bag was packed with a powdery **fertilizer** (containing ammonium phosphate, urea, K, and gypsum) and applied to a Welsh onion field to show higher growth-promoting effect than a **control granular fertilizer** with the same composition

IT 25322-68-3, Polyethylene glycol

RL: AGR (Agricultural use); BIOL (Biological study); USES (Uses)  
(**controlled-release fertilizers** packaged  
with porous materials or **coating** materials)

RN 25322-68-3 HCAPLUS

CN Poly(oxy-1,2-ethanediyl),  $\alpha$ -hydro- $\omega$ -hydroxy- (CA INDEX NAME)



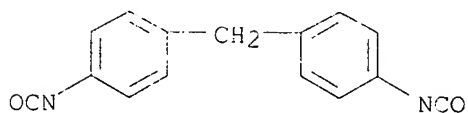
L134 ANSWER 28 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 1998:787154 HCAPLUS

DN 130:99918

TI Effect of chemical structure on the biodegradation of

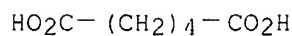
- polyurethanes** under composting conditions
- AU Kim, Young Duk; Kim, Sung Chul
- CS Department of Chemical Engineering, Korea Advanced Institute of Science and Technology, Taejon, 305-701, S. Korea
- SO Polymer Degradation and Stability (1998), 62(2), 343-352  
CODEN: PDSTDW; ISSN: 0141-3910
- PB Elsevier Science Ltd.
- DT Journal
- LA English
- AB Polyester-**polyurethanes** having different chemical structure were synthesized and their biodegradabilities were investigated. Average mol. weight of the synthesized **polyurethanes** ranged from 79 106 to 161 715 (Mw) by gel permeation chromatog. Degradation expts. were conducted by: hydrolytic degradation in NaOH solution; enzymic degradation by lipase; and composting. Hydrolytic and enzymic degradation decreased with the increase of the diol carbon chains in **polyol**, and increased by substituting aromatic **diisocyanate** with aliphatic **diisocyanate**. It is considered that hydrophobicity and hard segment formation seem to resist the hydrolytic and enzymic degradation of **polyurethanes**. Synthesized **polyurethanes** were biodegradable under composting condition to a certain extent depending on their chemical structures. As the hard segment content was increased, biodegrdn. rate decreased. Biodegrdn. rate of **polyurethanes** increased with the following order of **diisocyanate** used: MDI<H12MDI<HDI. **Polyurethane** composed of aliphatic **diisocyanate** showed higher biodegrdn. rate than **polyurethane** composed of aromatic **diisocyanate**. These facts indicate that the presence and content of hard segment in **polyurethane** effect the biodegradability under composting condition. As the diol carbon chains of **polyol** increased, biodegrdn. rate under composting condition increased. When the **polyol** used is poly(hexamethylene adipate)diol of poly(caprolactone)diol, **polyurethane** showed maximum biodegrdn. rate under composting condition. Surface hydrophobicity, which is related to good adhesion of bacteria on the polymer surface, is considered to be a factor on biodegrdn. rate under composting condition.
- IT 101-68-8D, Mdi, polymers with polycaprolactone diol  
25931-01-5, Adipic acid-ethylene glycol-MDI copolymer  
26375-23-5, Adipic acid-1,4-butanediol-mdi copolymer  
31075-20-4 219319-53-6  
RL: POL (Pollutant); REM (Removal or disposal); OCCU (Occurrence); PROC (Process)  
(effect of chemical structure on biodegrdn. of **polyurethanes** under composting conditions)
- RN 101-68-8 HCAPLUS
- CN Benzene, 1,1'-methylenebis[4-isocyanato- (CA INDEX NAME)]



- RN 25931-01-5 HCAPLUS
- CN Hexanedioic acid, polymer with 1,2-ethanediol and 1,1'-methylenebis[4-isocyanatobenzene] (CA INDEX NAME)

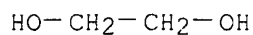
CM 1

CRN 124-04-9  
CMF C6 H10 O4



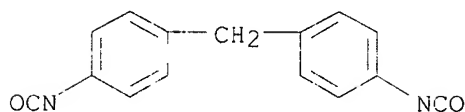
CM 2

CRN 107-21-1  
CMF C2 H6 O2



CM 3

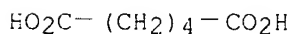
CRN 101-68-8  
CMF C15 H10 N2 O2



RN 26375-23-5 HCAPLUS  
CN Hexanedioic acid, polymer with 1,4-butanediol and 1,1'-methylenebis[4-isocyanatobenzene] (CA INDEX NAME)

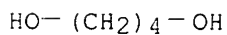
CM 1

CRN 124-04-9  
CMF C6 H10 O4



CM 2

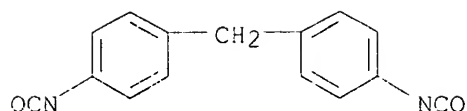
CRN 110-63-4  
CMF C4 H10 O2



CM 3

CRN 101-68-8  
CMF C15 H10 N2 O2





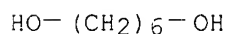
RN 31075-20-4 HCAPLUS

CN Hexanedioic acid, polymer with 1,6-hexanediol and 1,1'-methylenebis[4-isocyanatobenzene] (CA INDEX NAME)

CM 1

CRN 629-11-8

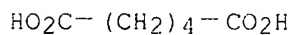
CMF C6 H14 O2



CM 2

CRN 124-04-9

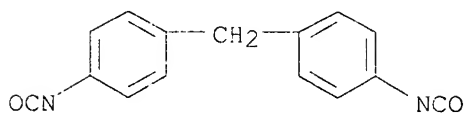
CMF C6 H10 O4



CM 3

CRN 101-68-8

CMF C15 H10 N2 O2



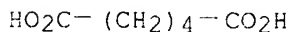
RN 219319-53-6 HCAPLUS

CN Hexanedioic acid, polymer with 1,10-decanediol and 1,1'-methylenebis[4-isocyanatobenzene] (9CI) (CA INDEX NAME)

CM 1

CRN 124-04-9

CMF C6 H10 O4



CM 2

CRN 112-47-0

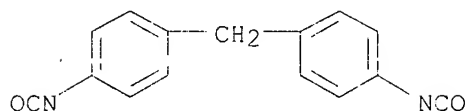
CMF C10 H22 O2

HO-(CH<sub>2</sub>)<sub>10</sub>-OH

CM 3

CRN 101-68-8

CMF C15 H10 N2 O2



## RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Bitritto, M	1979	35	405	J Appl Polym Sci	HCAPLUS
Bloembergen, S	1994			Biodegradable Plasti	
Darby, R	1968	16	900	Appl Microbiol	HCAPLUS
Dee, L	1980	52	572	Anal Chem	HCAPLUS
Dibenedetto, L	1987	57	404	Polym Mater Sci Eng	HCAPLUS
Gardner, R	1994	52	1477	J Appl Polym Sci	HCAPLUS
Gerson, D	1979	106	29	ACS Symp Ser	HCAPLUS
Good, R	1977	59	398	J Colloid Interface	HCAPLUS
Gu, J	1993	1	143	J Environ Polym Degr	HCAPLUS
Gu, J	1994	2	129	J Environ Polym Degr	HCAPLUS
Hepburn, C				Polyurethane Elastom	
Huang, S	1981	172	471	ACS Symp Ser	HCAPLUS
Huang, S	1992		147	Biodegradable Polyme	
Huang, S	1985	1	61	J Bioact Compat Poly	
Itavaara, M	1996	4	29	J Environ Polym Degr	HCAPLUS
Kaplan, A	1968	9	201	Developments in Indu	
Marshall, K			133	Bacterial Adhesion	
Mergaert, J	1994	2	177	J Environ Polym Degr	HCAPLUS
Ossefort, Z	1966	39	1308	Rubber Chem Technol	HCAPLUS
Pringle, J	1983		311	Appl Environ Micro	
Tokiwa, Y	1988	52	1937	Agric Biol Chem	HCAPLUS
Tokiwa, Y	1977	270	76	Nature	
Wiencek, K	1992		99	Biofilms-Science and	
Zisman, W	1964	43	1	Adv Chem Ser	HCAPLUS

L134 ANSWER 29 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 1998:786165 HCAPLUS

DN 130:37852

TI **Coating agents for granular fertilizers and  
controlled-release coated granular  
fertilizers**

IN Ota, Yoshihisa

PA Sanyo Chemical Industries Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

DT **Patent**

LA Japanese

FAN.CNT 1

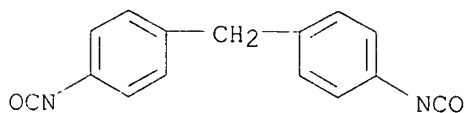
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 10324587	A	19981208	JP 1997-152817	19970526 <--
	JP 3161997	B2	20010425		
PRAI	JP 1997-152817		19970526	<--	

AB The title **coating** agents comprise **polyurethanes** containing 0.5-20 weight% C3-12 oxyalkylene groups and 1-10 weight% ester linkages from **polyols** and **polyisocyanates**. The **coating** films after release of **fertilizer** components are decomposed by hydrolysis with acids or alkalies in soil. A **granular fertilizer** containing (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub> (I) was spray-coated with a 560:440 (by weight) mixture of castor oil and reaction products of glycerin-propylene oxide adduct and MDI and cured to give a **coated fertilizer** (coating ratio 6 weight%). The rates of release of I from the **coated fertilizer** in H<sub>2</sub>O at 25° were 13.0, 30.2, 56.7, and 82.3% within 2, 3, 4, and 5 mo, resp.

IT 101-68-8DP, MDI, polymers with castor oil and **polyols** 9051-49-4DP, Polypropylene glycol Pentaerythritol ether, polymers with castor oil and MDI 25723-16-4DP, Polypropylene glycol trimethylolpropane ether, polymers with castor oil and MDI 25791-96-2DP, Polypropylene glycol glycerin ether, polymers with castor oil and MDI 51178-86-0DP, Polypropylene glycol ethylenediamine ether, polymers with castor oil and MDI  
 RL: AGR (Agricultural use); PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); BIOL (Biological study); PREF (Preparation); PROC (Process); USES (Uses)  
 (coating agents for **granular fertilizers** and **controlled-release coated granular fertilizers**)

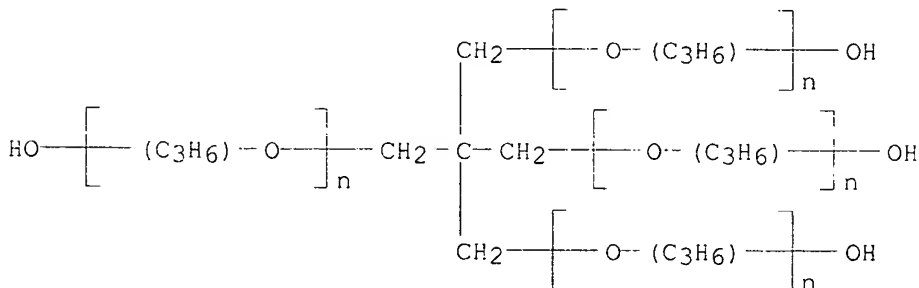
RN 101-68-8 HCAPLUS

CN Benzene, 1,1'-methylenebis[4-isocyanato- (CA INDEX NAME)]



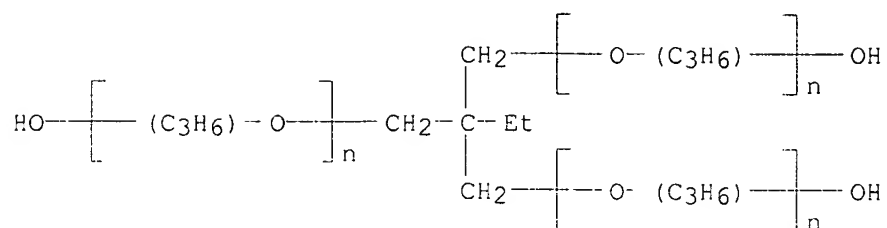
RN 9051-49-4 HCAPLUS

CN Poly[oxy(methyl-1,2-ethanediyl)], α-hydro-ω-hydroxy-, ether with 2,2-bis(hydroxymethyl)-1,3-propanediol (4:1) (CA INDEX NAME)

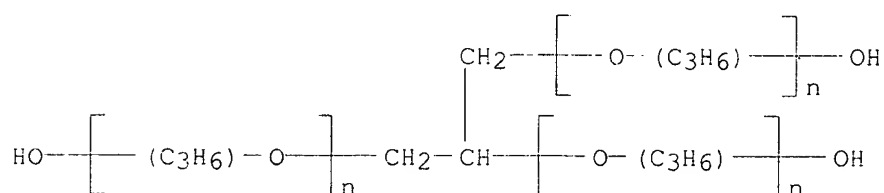


RN 25723-16-4 HCAPLUS

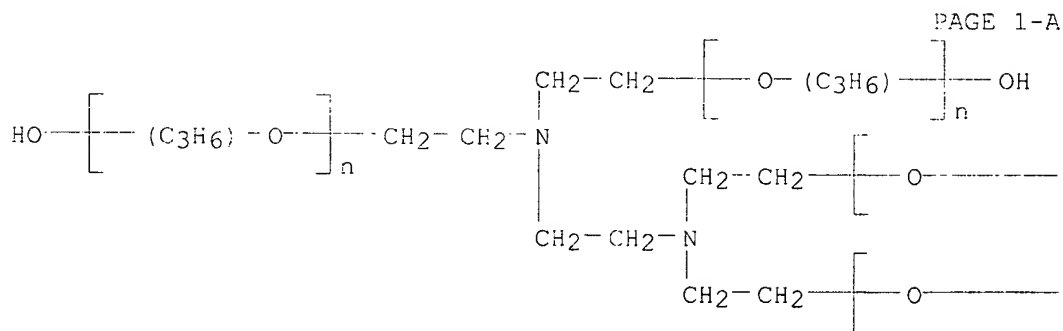
CN Poly[oxy(methyl-1,2-ethanediyl)], α-hydro-ω-hydroxy-, ether with 2-ethyl-2-(hydroxymethyl)-1,3-propanediol (3:1) (CA INDEX NAME)



RN 25791-96-2 HCAPLUS

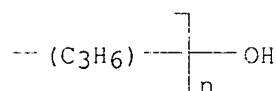
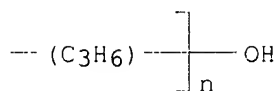
CN Poly[oxy(methyl-1,2-ethanediyl)],  $\alpha, \alpha', \alpha''$ -1,2,3-propanetriyltris[ $\omega$ -hydroxy- (CA INDEX NAME)]

RN 51178-86-0 HCAPLUS

CN Poly[oxy(methyl-1,2-ethanediyl)],  $\alpha, \alpha', \alpha'', \alpha'''$ -[1,2-ethanediylbis[nitrilobis(methyl-2,1-ethanediyl)]]tetrakis[ $\omega$ -hydroxy- (CA INDEX NAME)]

4 ( D1-Me )

PAGE 1-B



L134 ANSWER 30 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 1998:653702 HCAPLUS

DN 129:275375

TI **Polyurethane-coated granular  
fertilizer**IN Komoriya, Haruhiko; Maeda, Kazuhiko; Shiota, Masayuki; Hirashima, Yoshi;  
Tsutsumi, Kentaro; Ootani, Mikio; Ikeda, Yukio

PA CENTRAL GLASS COMPANY, LIMITED, Japan

SO Eur. Pat. Appl., 15 pp.

CODEN: EPXXDW

DT **Patent**

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 867422	A2	19980930	EP 1998-105417	19980325 <--
	EP 867422	A3	19991013		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	JP 10265288	A	19981006	JP 1997-73230	19970326 <--
	JP 10291881	A	19981104	JP 1997-97622	19970415 <--
	JP 3496798	B2	20040216		
	NO 9801350	A	19980928	NO 1998-1350	19980325 <--
	US 6176891	B1	20010123	US 1998-48111	19980326 <--
	TW 442448	B	20010623	TW 1998-87104758	19980326 <--
	US 6322606	B1	20011127	US 2000-665123	20000920 <--
PRAI	JP 1997-73230	A	19970326 <--		
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	US 1998-48111	A3	19980326 <--		

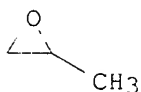
AB The invention relates to a **coated granular fertilizer** having a film covering **fertilizer granules**. This film comprises a **polyurethane** resin prepared by a method comprising the steps of (a) reacting an aromatic **polyisocyanate** with a first **polyol** component (i.e., castor oil or a castor oil derivative), thereby to obtain a prepolymer having terminal **isocyanate** groups in the mol.; and (b) reacting the prepolymer with a second **polyol** component (i.e., castor oil or a castor oil derivative) and a third **polyol** component which is an amine having at least two hydroxyl groups in the mol., thereby to cure the prepolymer and thus to prepare the **polyurethane** resin. The invention relates to another **coated granular fertilizer** having a film covering **fertilizer granules**. This film comprises a **urethane** resin and aqueous-fluid-absorbing **particles** having

a **particle** diameter of from 1 to 200  $\mu\text{m}$ . This **urethane** resin may be the above **polyurethane** resin. This **coated granular fertilizer** can be produced by a method comprising the steps of (a) applying an aromatic **polyisocyanate**, a **polyol** component (i.e., castor oil or a castor oil derivative), an amine, and the aqueous-fluid-absorbing **particles**, at the same time or sep. in no special order, while the **fertilizer granules** are kept fluidized or rolled, thereby to form a precursory film on the **fertilizer granules**; and (b) curing the precursory film into the film. Each **coated granular fertilizer** is superior in regulation of the release of **plant** nutrient elements therefrom.

IT 75-56-9D, Propylene oxide, amine adduct, reaction product with diphenylmethane **diisocyanate**-modified castor oil  
 101-68-8D, Diphenylmethane **diisocyanate**, castor oil modified by, reaction product with **polyol** amine  
 26471-62-5D, Tolylene **diisocyanate**, castor oil modified by, reaction product with **polyol** amine  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (coating for **granular fertilizers**)

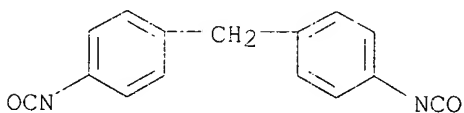
RN 75-56-9 HCAPLUS

CN Oxirane, 2-methyl- (CA INDEX NAME)



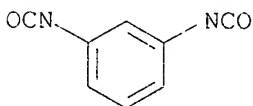
RN 101-68-8 HCAPLUS

CN Benzene, 1,1'-methylenebis[4-isocyanato- (CA INDEX NAME)



RN 26471-62-5 HCAPLUS

CN Benzene, 1,3-diisocyanatomethyl- (CA INDEX NAME)



D1-- Me

L134 ANSWER 31 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 1998:41819 HCAPLUS

DN 128:115400

TI Base-degradable nonaqueous **polyurethane** useful in applications where delamination of the laminated composite or **coating** removal is desirable or as **encapsulating** agents for **slow**

**release** of materials

IN Dodge, Jeffrey A.; Sarpeshkar, Ashok M.; Markusch, Peter H.; Dormish, Jeffrey F.

PA Bayer Corporation, USA

SO U.S., 6 pp.

CODEN: USXXAM

DT **Patent**

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 5708073	A	19980113	US 1996-652884	19960523 <--
	CA 2203867	A1	19971123	CA 1997-2203867	19970428 <--
PRAI	US 1996-652884	A	19960523	<--	

AB Title **polyurethane** is prepared by reacting an organic **polyisocyanate** with a hydroxyl group-containing hydrophilic composition. The hydrophilic composition has an average OH functionality 1.5-4 and contains  $\geq 0.1\%$  ionic and/or acidic groups,  $\geq 25\%$  polyester groups, and preferably  $\geq 20\%$  polyoxyethylene groups having  $\geq 5$  oxyethylene units in length. Thus, a **polyurethane** film which degraded within 9 min after immersion in 3% aqueous NaOH at 70° was prepared from a formulation comprising **polyol** blends, which have an average OH functionality 2.79, ethylene oxide unit 47.6%, ionic/acidic groups 1.6%, and ester groups 42.3% and comprise trimethylolpropane-started polyether ester triol composed of adipic acid and polyethylene oxide (Mw 4550) 84.6, 2,2-bis(hydroxymethyl)propionic acid 1.7, propoxylated sodium salt of 1,4-dihydroxy-2-butanedisulfonic acid 6.3, Bu Carbitol-started polyethylene oxide-polypropylene oxide monool (I) (Mw 2200) 3.7, and bisphenol A-started polypropylene oxide **polyol** (Mw 550) 2.8 parts, and 24.3 parts **urethane**-modified **polyisocyanate** prepared by the reaction of a polymeric diphenylmethane **diisocyanate** with I.

IT 201555-86-4P 201555-87-5P 201555-88-6P  
201555-89-7P

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(preparation of base-degradable nonaq. **polyurethane** useful in applications where delamination of laminated composite or **coating** removal is desirable or as **encapsulating** agents for **slow release** of materials)

RN 201555-86-4 HCAPLUS

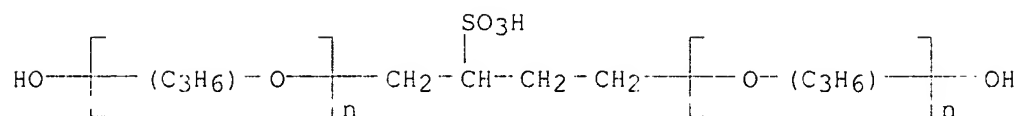
CN Hexanedioic acid, polymer with  $\alpha$ -hydro- $\omega$ -hydroxypoly(oxy-1,2-ethanediyl) ether with 2-ethyl-2-(hydroxymethyl)-1,3-propanediol (3:1), 3-hydroxy-2-(hydroxymethyl)-2-methylpropanoic acid,  $\alpha, \alpha'$ -[(1-methylethylidene)di-4,1-phenylene]bis[ $\omega$ -hydroxypoly[oxy(methyl-1,2-ethanediyl)]]], methyloxirane polymer with oxirane 2-(2-butoxyethoxy)ethyl ether, polymethylenepolyphenylene isocyanate and  $\alpha, \alpha'$ -(2-sulfo-1,4-butanediyl)bis[ $\omega$ -hydroxypoly[oxy(methyl-1,2-ethanediyl)]] monosodium salt (9CI) (CA INDEX NAME)

CM 1

CRN 59871-54-4

CMF (C3 H6 O)<sub>n</sub> (C3 H6 O)<sub>n</sub> C4 H10 O5 S . Na

CCI IDS, PMS



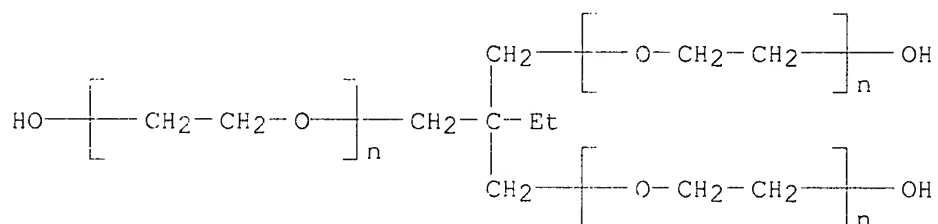
● Na

CM 2

CRN 50586-59-9

CMF (C2 H4 O)<sub>n</sub> (C2 H4 O)<sub>n</sub> (C2 H4 O)<sub>n</sub> C6 H14 O3

CCI PMS

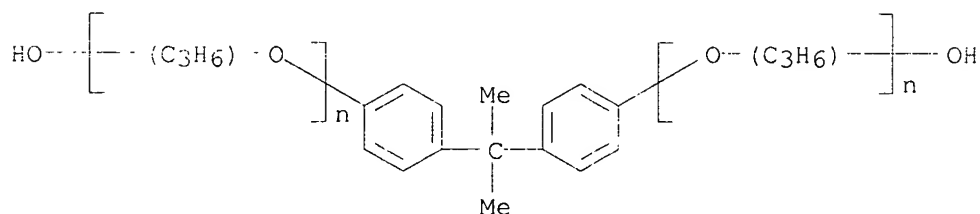


CM 3

CRN 37353-75-6

CMF (C3 H6 O)<sub>n</sub> (C3 H6 O)<sub>n</sub> C15 H16 O2

CCI IDS, PMS



CM 4

CRN 9016-87-9

CMF Unspecified

CCI PMS, MAN

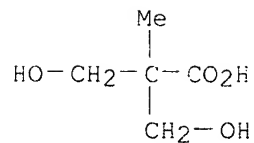
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CRN 4767-03-7

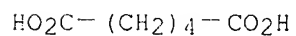
CMF C5 H10 O4





CM 6

CRN 124-04-9  
CMF C6 H10 O4

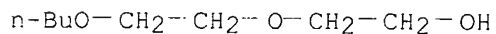


CM 7

CRN 85637-75-8  
CMF C8 H18 O3 . (C3 H6 O . C2 H4 O) x

CM 8

CRN 112-34-5  
CMF C8 H18 O3

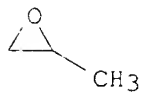


CM 9

CRN 9003-11-6  
CMF (C3 H6 O . C2 H4 O) x  
CCI PMS

CM 10

CRN 75-56-9  
CMF C3 H6 O



CM 11

CRN 75-21-8  
CMF C2 H4 O



RN 201555-87-5 HCAPLUS

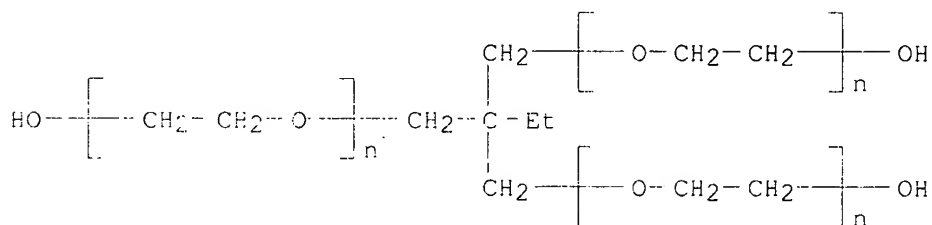
CN Hexanedioic acid, polymer with  $\alpha$ -hydro- $\omega$ -hydroxypoly(oxy-1,2-ethanediyl) ether with 2-ethyl-2-(hydroxymethyl)-1,3-propanediol (3:1), 3-hydroxy-2-(hydroxymethyl)-2-methylpropanoic acid,  $\alpha, \alpha'$ -[(1-methylethylidene)di-4,1-phenylene]bis[ $\omega$ -hydroxypoly[oxy(methyl-1,2-ethanediyl)]]], methyloxirane polymer with oxirane 2-(2-butoxyethoxy)ethyl ether and polymethylenepolyphenylene isocyanate (9CI) (CA INDEX NAME)

CM 1

CRN 50586-59-9

CMF (C2 H4 O)<sub>n</sub> (C2 H4 O)<sub>n</sub> (C2 H4 O)<sub>n</sub> C6 H14 O3

CCI PMS

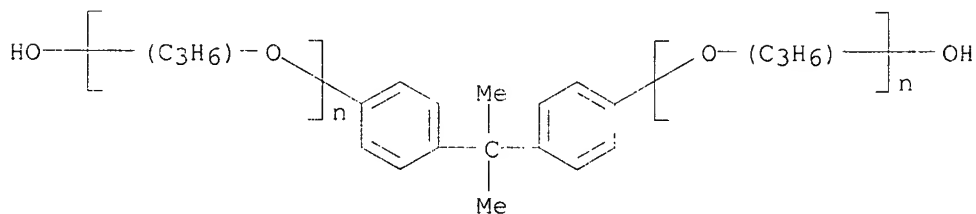


CM 2

CRN 37353-75-6

CMF (C3 H6 O)<sub>n</sub> (C3 H6 O)<sub>n</sub> C15 H16 O2

CCI IDS, PMS



CM 3

CRN 9016-87-9

CMF Unspecified

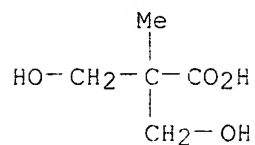
CCI PMS, MAN

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

CM 4

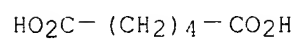
CRN 4767-03-7

CMF C5 H10 O4



CM 5

CRN 124-04-9  
 CMF C6 H10 O4

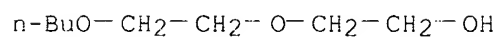


CM 6

CRN 85637-75-8  
 CMF C8 H18 O3 . (C3 H6 O . C2 H4 O) x

CM 7

CRN 112-34-5  
 CMF C8 H18 O3

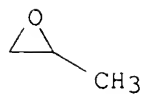


CM 8

CRN 9003-11-6  
 CMF (C3 H6 O . C2 H4 O) x  
 CCI PMS

CM 9

CRN 75-56-9  
 CMF C3 H6 O



CM 10

CRN 75-21-8  
 CMF C2 H4 O



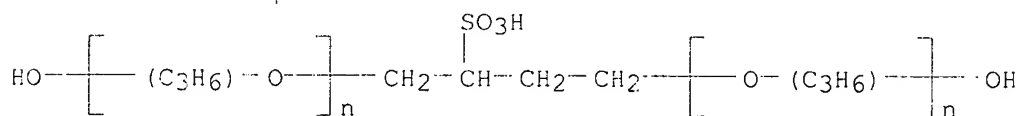
RN 201555-88-6 HCAPLUS  
 CN Hexanedioic acid, polymer with 1,4-butanediol, 3-hydroxy-2-(hydroxymethyl)-2-methylpropanoic acid,  $\alpha,\alpha'$ -[(1-methylethylidene)di-4,1-phenylene]bis[ $\omega$ -hydroxypoly[oxy(methyl-1,2-ethanediyl)]]], methyloxirane polymer with oxirane 2-(2-butoxyethoxy)ethyl ether, polymethylenepolyphenylene isocyanate and  $\alpha,\alpha'$ -(2-sulfo-1,4-butanediyl)bis[ $\omega$ -hydroxypoly[oxy(methyl-1,2-ethanediyl)]] monosodium salt (9CI) (CA INDEX NAME)

CM 1

CRN 59871-54-4

CMF (C3 H6 O)<sub>n</sub> (C3 H6 O)<sub>n</sub> C4 H10 O5 S . Na

CCI IDS, PMS



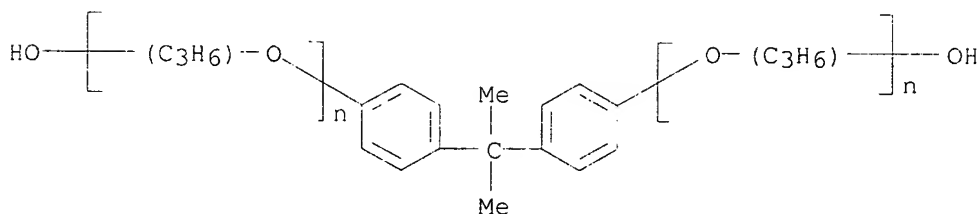
Na

CM 2

CRN 37353-75-6

CMF (C3 H6 O)<sub>n</sub> (C3 H6 O)<sub>n</sub> C15 H16 O2

CCI IDS, PMS



CM 3

CRN 9016-87-9

CMF Unspecified

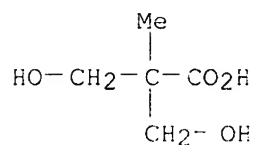
CCI PMS, MAN

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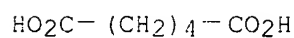
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CMF C5 H10 O4



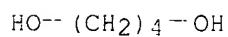
CM 5

CRN 124-04-9  
 CMF C6 H10 O4



CM 6

CRN 110-63-4  
 CMF C4 H10 O2

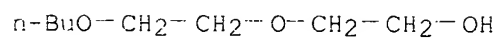


CM 7

CRN 85637-75-8  
 CMF C8 H18 O3 . (C3 H6 O . C2 H4 O) x

CM 8

CRN 112-34-5  
 CMF C8 H18 O3

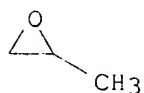


CM 9

CRN 9003-11-6  
 CMF (C3 H6 O . C2 H4 O) x  
 CCI PMS

CM 10

CRN 75-56-9  
 CMF C3 H6 O



CM 11

CRN 75-21-8

CMF C2 H4 O



RN 201555-89-7 HCAPLUS

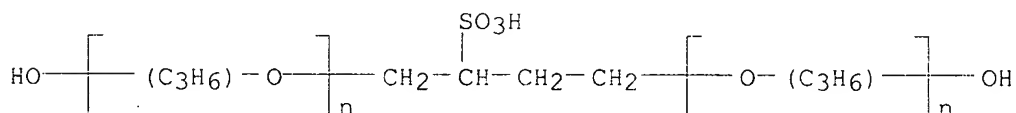
CN Hexanedioic acid, polymer with  $\alpha$ -hydro- $\omega$ -hydroxypoly(oxy-1,2-ethanediyl) ether with 2-ethyl-2-(hydroxymethyl)-1,3-propanediol (3:1),  $\alpha, \alpha'$ -[(1-methylethylidene)di-4,1-phenylene]bis[ $\omega$ -hydroxypoly[oxy(methyl-1,2-ethanediyl)]]], methyloxirane polymer with oxirane 2-(2-butoxyethoxy)ethyl ether, polymethylenepolyphenylene isocyanate and  $\alpha, \alpha'$ -(2-sulfo-1,4-butanediyl)bis[ $\omega$ -hydroxypoly[oxy(methyl-1,2-ethanediyl)]] monosodium salt (9CI) (CA INDEX NAME)

CM 1

CRN 59871-54-4

CMF (C3 H6 O)<sub>n</sub> (C3 H6 O)<sub>n</sub> C4 H10 O5 S . Na

CCI IDS, PMS



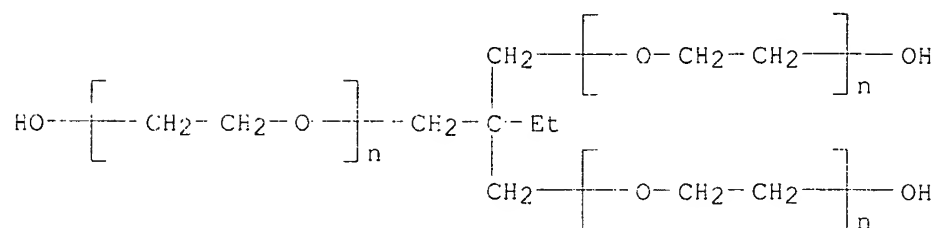
● Na

CM 2

CRN 50586-59-9

CMF (C2 H4 O)<sub>n</sub> (C2 H4 O)<sub>n</sub> (C2 H4 O)<sub>n</sub> C6 H14 O3

CCI PMS

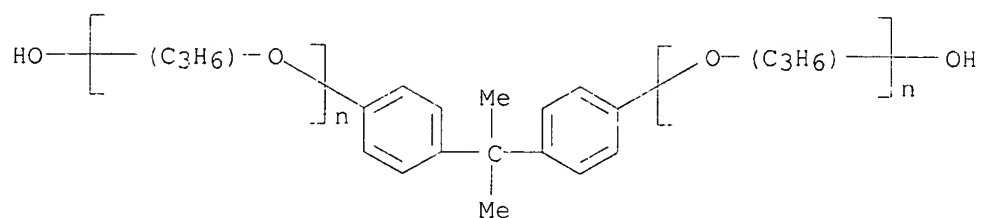


CM 3

CRN 37353-75-6

CMF (C3 H6 O)<sub>n</sub> (C3 H6 O)<sub>n</sub> C15 H16 O2

CCI IDS, PMS



CM 4

CRN 9016-87-9

CMF Unspecified

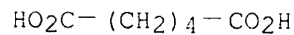
CCI PMS, MAN

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

CM 5

CRN 124-04-9

CMF C6 H10 O4



CM 6

CRN 85637-75-8

CMF C8 H18 O3 . (C3 H6 O . C2 H4 O)<sub>x</sub>

CM 7

CRN 112-34-5

CMF C8 H18 O3

n-BuO-CH<sub>2</sub>-CH<sub>2</sub>-O-CH<sub>2</sub>-CH<sub>2</sub>-OH

CM 8

CRN 9003-11-6

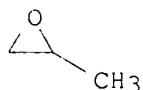
CMF (C3 H6 O . C2 H4 O) x

CCI PMS

CM 9

CRN 75-56-9

CMF C3 H6 O



CM 10

CRN 75-21-8

CMF C2 H4 O



# RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Blum	1992			US 5126393	HCAPLUS
Dieterich	1981			US 4293474	HCAPLUS
D'Haese	1995			US 5380779	HCAPLUS
Gomi	1986			US 4622360	HCAPLUS
Mosbach	1988			US 4764553	HCAPLUS
Taylor	1977			US 4053666	
Taylor	1977			US 4055441	

L134 ANSWER 32 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 1997:664186 HCAPLUS

DN 127:330866

TI Thermoplastic resin-coated sustained-release  
fertilizer granules

IN Nakamura, Hiroshi

PA Sumitomo Chemical Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 4 pp.

CODEN: JKXXAF

DT Patent

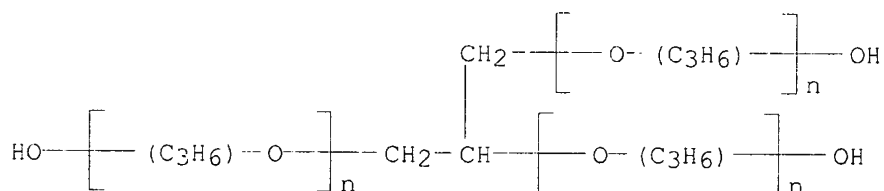
LA Japanese

FAN.CNT 2

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 09263474	A	19971007	JP 1996-76007	19960329 <--



AU 9712569 A 19970814 AU 1997-12569 19970206 <--  
 AU 704560 B2 19990429  
 PRAI JP 1996-22499 A 19960208 <--  
 JP 1996-76007 A 19960329 <--  
 AB The title **granules** are obtained by **coating**  
**fertilizer granules** with thermoplastic resins containing  
 dispersed powders insol. in or immiscible with water. Urea  
**granules** were **coated** with a mixture of clay, Sumidur 44V10  
 (polymeric MDI), Sumiphen TM (polyether-**polyol**), and Sumicure D  
 (catalyst) to give a **sustained-release**  
**fertilizer**.  
 IT 57029-46-6  
 RL: AGR (Agricultural use); POF (Polymer in formulation); BIOL (Biological  
 study); USES (Uses)  
 (sustained-release fertilizer  
 granules coated with thermoplastic resins and  
 water-insol. powders)  
 RN 57029-46-6 HCAPLUS  
 CN Isocyanic acid, polymethylenepolyphenylene ester, polymer with  
 $\alpha, \alpha', \alpha''$ -1,2,3-propanetriyltris[ $\omega$ -  
 hydroxypoly[oxy(methyl-1,2-ethanediyl)]] (CA INDEX NAME)  
 CM 1  
 CRN 25791-96-2  
 CMF (C3 H6 O)<sub>n</sub> (C3 H6 O)<sub>n</sub> (C3 H6 O)<sub>n</sub> C3 H8 O3  
 CCI IDS, PMS



CM 2

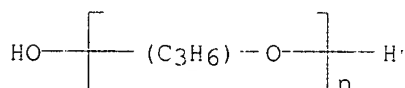
CRN 9016-87-9  
 CMF Unspecified  
 CCI PMS, MAN

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

L134 ANSWER 33 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN  
 AN 1997:542738 HCAPLUS  
 DN 127:205058  
 TI **Controlled-release fertilizers**  
**coated** with thermosetting resins  
 IN Nakamura, Hiroshi  
 PA Sumitomo Chemical Co., Ltd., Japan  
 SO Jpn. Kokai Tokkyo Koho, 5 pp.  
 CODEN: JKXXAF  
 DT **Patent**  
 LA Japanese  
 FAN.CNT 2

PATENT NO. KIND DATE APPLICATION NO. DATE

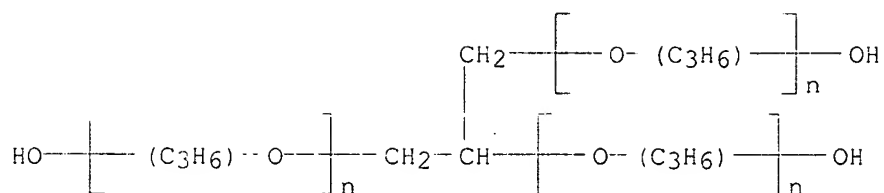
FI JP 09208355 A 19970812 JP 1996-22499 19960208 <--  
 JP 3435959 B2 20030811  
 AU 9712569 A 19970814 AU 1997-12569 19970206 <--  
 AU 704560 B2 19990429  
 PRAI JP 1996-22499 A 19960208 <--  
 JP 1996-76007 A 19960329 <--  
 AB Title **fertilizers** comprise **granular fertilizers coated** with  $\geq 2$  thermally cured thermosetting resins having different hydrophilicity. Sumidur 44V10 (polymeric MDI, NCO equivalent 135 g) 135, Sumiphen TM (**polyol**, OH equivalent 148 g) 148, and Sumicure D [2,4,6-tris(dimethylaminomethyl)phenol] 2.8 weight parts were heated at 70° for 30 min to give a cured resin showing water absorption (after soaking in boiling water for 24 h) 2.17%. Urea **granule** was **coated** with 8 weight% of the resin to prepare a **fertilizer** showing 80% active ingredient dissoln. after .apprx.130 days.  
 IT 53862-89-8 57029-46-6 61111-77-1  
 RL: AGR (Agricultural use); BIOL (Biological study); USES (Uses) (**controlled-release fertilizers coated** with thermosetting resins)  
 RN 53862-89-8 HCAPLUS  
 CN Isocyanic acid, polymethylenepolyphenylene ester, polymer with  $\alpha$ -hydro- $\omega$ -hydroxypoly[oxy(methyl-1,2-ethanediyl)] (CA INDEX NAME)  
 CM 1  
 CRN 25322-69-4  
 CMF (C3 H6 O)<sub>n</sub> H2 O  
 CCI IDS, PMS



CM 2  
 CRN 9016-87-9  
 CMF Unspecified  
 CCI PMS, MAN

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

RN 57029-46-6 HCAPLUS  
 CN Isocyanic acid, polymethylenepolyphenylene ester, polymer with  $\alpha, \alpha', \alpha''$ -1,2,3-propanetriyltris[ $\omega$ -hydroxypoly[oxy(methyl-1,2-ethanediyl)]] (CA INDEX NAME)  
 CM 1  
 CRN 25791-96-2  
 CMF (C3 H6 O)<sub>n</sub> (C3 H6 O)<sub>n</sub> (C3 H6 O)<sub>n</sub> C3 H8 O3  
 CCI IDS, PMS



CM 2

CRN 9016-87-9

CMF Unspecified

CCI PMS, MAN

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

RN 61111-77-1 HCAPLUS

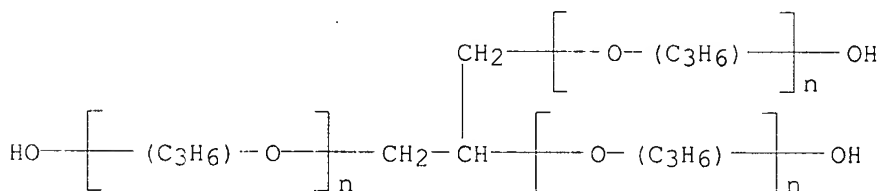
CN Isocyanic acid, polymethylenepolyphenylene ester, polymer with  
 $\alpha$ -hydro- $\omega$ -hydroxypoly[oxy(methyl-1,2-ethanediyl)] and  
 $\alpha, \alpha', \alpha''$ -1,2,3-propanetriyltris[ $\omega$ -  
hydroxypoly[oxy(methyl-1,2-ethanediyl)]] (CA INDEX NAME)

CM 1

CRN 25791-96-2

CMF  $(\text{C}_3 \text{ H}_6 \text{ O})_n (\text{C}_3 \text{ H}_6 \text{ O})_n (\text{C}_3 \text{ H}_6 \text{ O})_n \text{C}_3 \text{ H}_8 \text{ O}_3$

CCI IDS, PMS

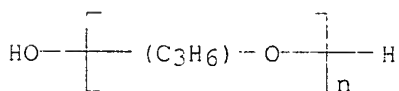


CM 2

CRN 25322-69-4

CMF  $(\text{C}_3 \text{ H}_6 \text{ O})_n \text{H}_2 \text{ O}$

CCI IDS, PMS



CM 3

CRN 9016-87-9

CMF Unspecified

CCI PMS, MAN

jan delaval - 13 february 2008

CRN 9016-87-9  
CMF Unspecified  
CCI PMS, MAN

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

L134 ANSWER 35 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN  
AN 1996:486067 HCAPLUS  
DN 125:141627  
TI **Controlled release fertilizers**  
IN Hudson, Alice P.; Woodward, Fred E.; Robinson, Louis  
PA USA  
SO U.S., 7 pp., Cont.-in-part of U.S. Ser. No. 719,975, abandoned.  
CODEN: USXXAM  
DT **Patent**  
LA English  
FAN.CNT 1

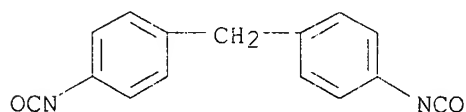
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 5538531	A	19960723	US 1994-177910	19940106 <--
PRAI	US 1991-719975	B2	19910624	<--	
AB	<b>Controlled release, particulate fertilizer</b> products, having a water soluble <b>fertilizer</b> central mass encased in a plurality of water insol., abrasion resistant <b>coatings</b> plus unique <b>coating</b> compns., are given. At least one essential inner <b>coating</b> is a <b>urethane</b> reaction product of (1) a <b>polyisocyanate</b> selected from diphenylmethane <b>diisocyanate</b> , toluene <b>diisocyanate</b> , derivs. thereof, polymers thereof and mixts. thereof, which contain about 1.5 to 3 <b>isocyanate</b> groups per mol. and between about 10 and 50% NCO, and (2) a <b>polyol</b> having about 2 to 6 hydroxyl moieties and at least one alkyl moiety containing about 10 to 22 carbon atoms, e.g. hydrogenated castor oil. An essential outer <b>coating</b> is formed of an organic wax having a drop m.p.50-120°.				
IT	<b>9016-87-9D</b> , PAPI 94, reaction product with castor oil RL: MOA (Modifier or additive use); USES (Uses) ( <b>coating for controlled release fertilizers</b> )				
RN	9016-87-9 HCAPLUS				
CN	Isocyanic acid, polymethylenepolyphenylene ester (CA INDEX NAME)				

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

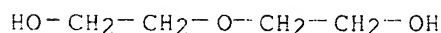
L134 ANSWER 36 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN  
AN 1996:371957 HCAPLUS  
DN 125:32774  
TI **Process for producing improved sulfur-coated urea slow-release fertilizers**  
IN Detrick, John H.  
PA USA  
SO PCT Int. Appl., 11 pp.  
CODEN: PIXXD2  
DT **Patent**  
LA English  
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
FI	WO 9609267	A1	19960328	WO 1995-US12060	19950922 <--
	W: AU, CA, CN, HU, JP, KP, KR, MX, NO, NZ				

RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE  
 US 5599374 A 19970204 US 1994-311672 19940923 <--  
 CA 2176605 A1 19960328 CA 1995-2176605 19950922 <--  
 CA 2176605 C 20051115  
 AU 9536811 A 19960409 AU 1995-36811 19950922 <--  
 AU 688602 B2 19980312  
 EP 730565 A1 19960911 EP 1995-934488 19950922 <--  
 EP 730565 B1 20010328  
 R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LI, NL, PT, SE  
 CN 1135745 A 19961113 CN 1995-190939 19950922 <--  
 CN 1072196 B 20011003  
 JP 10513144 T 19981215 JP 1996-511086 19950922 <--  
 JP 3006774 B2 20000207  
 AT 200071 T 20010415 AT 1995-934488 19950922 <--  
 PT 730565 T 20010731 PT 1995-934488 19950922 <--  
 ES 2157347 T3 20010816 ES 1995-934488 19950922 <--  
 NO 9602090 A 19960621 NO 1996-2090 19960522 <--  
 GR 3036059 T3 20010928 GR 2001-400901 20010615 <--  
 PRAI US 1994-311672 A 19940923 <--  
 WO 1995-US12060 W 19950922 <--  
 AB The invention describes a sulfur-coated urea **slow-release granular fertilizer**, having a uniform, durable polymeric **coating** over the sulfur-coating. The polymer **coating** is formed by the direct in situ copolymn. of diethylene glycol-triethanolamine **polyol** and a **diisocyanate** on the surface of the sulfur-coated urea **granule**. The polymeric **coating** provides improved impact resistance of the composite **coated granule**.  
 IT 101-68-8D, 4,4'-Diphenylmethane **diisocyanate**, polymer with polyester **polyol** and DEG 177912-04-8  
 RL: MOA (Modifier or additive use); USES (Uses) (overcoat; sulfur-coated urea **slow-release fertilizers**)  
 RN 101-68-8 HCAPLUS  
 CN Benzene, 1,1'-methylenebis[4-isocyanato- (CA INDEX NAME)]

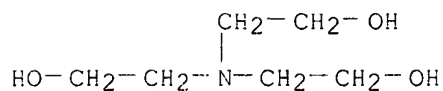


RN 177912-04-8 HCAPLUS  
 CN Ethanol, 2,2',2''-nitrilotris-, polymer with 1,1'-methylenebis[4-isocyanatobenzene] and 2,2'-oxybis[ethanol] (CA INDEX NAME)  
 CM 1  
 CRN 111-46-6  
 CMF C4 H10 O3



CM 2  
 CRN 102-71-6

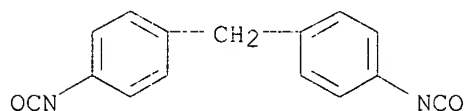
CMF C6 H15 N O3



CM 3

CRN 101-68-8

CMF C15 H10 N2 O2



L134 ANSWER 37 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 1995:312555 HCAPLUS

DN 122:80293

TI Manufacture of **slow-release fertilizers** with polymeric **coating** materials

PA Korea Institute of Science and Technology, S. Korea

SO Jpn. Kokai Tokkyo Koho, 8 pp.

CODEN: JKXXAF

DT **Patent**

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 06279161	A	19941004	JP 1993-149938	19930622 <--
	JP 08025828	B	19960313		
	KR 9506288	B1	19950613	KR 1992-12221	19920709 <--
PRAI	KR 1992-12221	A	19920709	<--	

AB Rosin (wood rosin, gum rosin, or oil rosin) 30-100 % by weight and its derivative

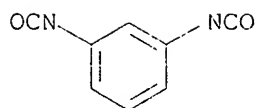
70-0 % by weight are mixed, and to this mixture is added a **coating** polymer such as Et cellulose (0-20 % by weight against the mixture), and then the **granules** are further **coated** with another polymer (protective material) like acrylic polymer to give a **slow-release fertilizer**. The first **coating** material is Et cellulose, poly(vinyl acetate), or vinyl acetate-rosin copolymer, whereas the protective **coating** material is Et cellulose, benzyl cellulose, poly(vinyl acetate), nitro cellulose, vinyl acetate-rosin copolymers, acrylic polymer, and styrene polymers.

IT **26471-62-5D**, Toluene **diisocyanate**, reaction products with rosins

RL: RCT (Reactant); RACT (Reactant or reagent)  
(in manufacture of **slow-release fertilizers**)

RN 26471-62-5 HCAPLUS

CN Benzene, 1,3-diisocyanatomethyl- (CA INDEX NAME)



D1-- Me

L134 ANSWER 38 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 1995:305821 HCAPLUS

DN 122:132144

TI Machine system and process for producing attrition-resistant **slow**  
**-release fertilizers.**

IN Detrick, John H.; Carney, Frederick Jr.

PA Pursell Industries, USA

SO U.S., 9 pp.

CODEN: USXXAM

DT **Patent**

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 5374292	A	19941220	US 1993-14519	19930208 <--
	US 5547486	A	19960820	US 1994-356572	19941215 <--
	US 6537611	B1	20030325	US 1998-78477	19980514 <--
PRAI	US 1993-14519	A1	19930208	<--	
	US 1994-356572	A1	19941215	<--	
	US 1996-652340	A3	19960522	<--	

AB In the process, a prewet solution is used to initially **coat** urea **granules**, followed by the sep. application of the individual components used in the **coating**. Prewetting is carried out prior to the reaction with an organic **diisocyanate**, such as diphenylmethane **diisocyanate**. The prewet solution comprises a **polyol**-catalyst, such as triethanolamine, and a water-soluble low mol. weight **polyol**, such as glycerol. Further concurrent or sequential pretreatment is carried out with a polyester **polyol**, such as polyethylene terephthalate polyester **polyol**. The machine system provides an improved means for uniformly applying a single layer or multiple layers of polymer **coatings** to the **granules**.

IT 161011-63-8

RL: AGR (Agricultural use); BIOL (Biological study); USES (Uses)  
(**coating for slow-release fertilizers**)

RN 161011-63-8 HCAPLUS

CN 1,4-Benzenedicarboxylic acid, polymer with  $\alpha$ -hydro- $\omega$ -hydroxypoly(oxy-1,2-ethanediyl) and 1,1'-methylenebis[4-isocyanatobenzene] (9CI) (CA INDEX NAME)

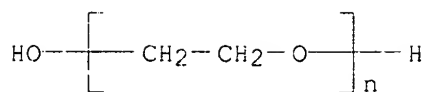
CM 1

CRN 25322-68-3

CMF (C2 H4 O)<sub>n</sub> H2 O

CCI PMS

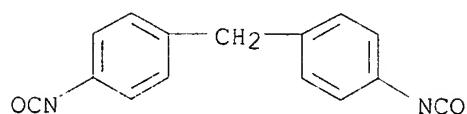




CM 2

CRN 101-68-8

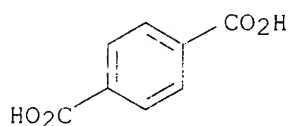
CMF C15 H10 N2 O2



CM 3

CRN 100-21-0

CMF C8 H6 O4



L134 ANSWER 39 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN.

AN 1994:115117 HCAPLUS

DN 120:115117

TI Plasticized gypsum composition

IN Roosen, Peter Paul; Koldyk, Gerard Henry; Pap, Frank

PA Accuflex Products Inc., Can.

SO PCT Int. Appl., 33 pp.

CODEN: PIXXD2

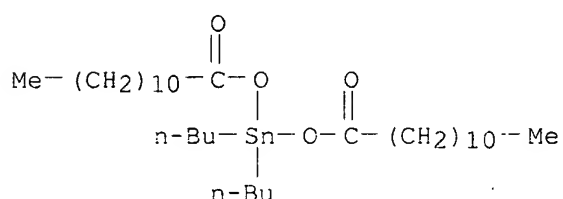
DT Patent

LA English

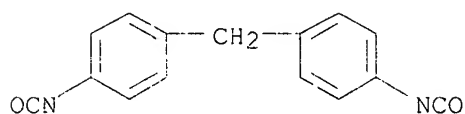
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9322253	A1	19931111	WO 1993-CA177	19930426 <--
	W: AT, AU, BB, BG, BR, CH, CZ, DE, DK, ES, FI, GB, HU, JP, KP, KR, LK, LU, MG, MN, MW, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SK, UA				
	RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG				
	CA 2084494	A1	19931029	CA 1992-2084494	19921203 <--
	CA 2084494	C	19970624		
	AU 9342572	A	19931129	AU 1993-42572	19930426 <--
	AU 672792	B2	19961017		
	DE 4391813	T0	19950413	DE 1993-4391813	19930426 <--
	JP 08500319	T	19960116	JP 1993-518795	19930426 <--
	US 5344490	A	19940906	US 1993-110920	19930824 <--
	GB 2281560	A	19950308	GB 1994-21672	19941027 <--

GB 2281560 B 19960529  
 PRAI US 1992-875181 A 19920428 <--  
 WO 1993-CA177 A 19930426 <--  
 AB The gypsum composition is plasticized by a polymer, e.g., **polyurethane**, and comprises 5-20 weight% polymerizable **isocyanate** and a mixture of 40-90 weight% gypsum and balance glyceride. The composition is prepared by blending the components in the prescribed proportions, and is used as a soil conditioner and building material.  
 IT **77-58-7, Dibutyltindilaurate**  
 RL: USES (Uses)  
 (accelerator, in composition containing plasticized gypsum and, for building materials and soil conditioner)  
 RN 77-58-7 HCAPLUS  
 CN Dodecanoic acid, 1,1'-(dibutylstannylene) ester (CA INDEX NAME)



IT **101-68-8, 4,4'-Diphenylmethane diisocyanate**  
**9016-87-9**  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (plasticizer, in composition containing glyceride and plasticized gypsum,  
 for building materials and soil conditioner)  
 RN 101-68-8 HCAPLUS  
 CN Benzene, 1,1'-methylenebis[4-isocyanato- (CA INDEX NAME)]



RN 9016-87-9 HCAPLUS  
 CN Isocyanic acid, polymethylenepolyphenylene ester (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

L134 ANSWER 40 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 1993:146822 HCAPLUS

DN 118:146822

TI **Polyurethane-coated granular fertilizers**

IN Buerger, Horst; Jaschkowitz, Michael; Kloth, Bernhard; Kohl, Wilhelm; Wegener, Holger; Wehr, Peter

PA Aglukon Spezialduenger GmbH, Germany

SO Ger. Offen., 11 pp.

CODEN: GWXXBX

DT **Patent**

LA German

FAN.CNT 1

PATENT NO.

KIND

DATE

APPLICATION NO.

DATE

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PI  DE 4127459      A1  19930225      DE 1991-4127459      19910820 <--
    DE 4127459      C2  19930729
    WO 9304017      A1  19930304      WO 1992-DE697        19920818 <--
        W: AU, CA, CS, FI, HU, JP, NO, PL, RU, US
        RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, SE
    AU 9224399      A   19930316      AU 1992-24399        19920818 <--
    AU 652663      B2  19940901
    EP 599927      A1  19940608      EP 1992-917606      19920818 <--
    EP 599927      B1  19970611
        R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LI, LU, MC, NL, SE
    JP 07500560     T   19950119      JP 1992-504031      19920818 <--
    HU 70289       A2  19950928      HU 1994-479         19920818 <--
    HU 218166      B   20000628
    AT 154341      T   19970615      AT 1992-917606      19920818 <--
    RU 2091357     C1  19970927      RU 1994-15604        19920818 <--
    ES 2104939     T3  19971016      ES 1992-917606      19920818 <--
    CZ 282958      B6  19971112      CZ 1994-367         19920818 <--
    CA 2115998     C   20030729      CA 1992-2115998      19920818 <--
    IL 102868      A   19951031      IL 1992-102868      19920819 <--
    ZA 9206284     A   19930518      ZA 1992-6284        19920820 <--
    NO 9400386     A   19940207      NO 1994-386         19940207 <--
PRAI DE 1991-4127459 A   19910820 <--
    WO 1992-DE697   A   19920818 <--

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AB NPK fertilizer granules are coated with a mixture of **polyisocyanate** and **polyol**. Curing is carried out by exposure to an airless fog of amine, e.g. Me<sub>2</sub>CHNMe<sub>2</sub>, as catalyst. The **coating** is 10-30, preferably 15-20 µm thick. The **coated granules** release mainly N initially, and then K.

L134 ANSWER 41 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 1993:80098 HCAPLUS

DN 118:80098

TI **Coated fertilizer granules.**

IN Uchida, Yasuzo; Yamashita, Minoru; Iwagami, Akio; Hatano, Kota

PA Yukishitsu Hiryo Seibutsu Kassei Riyo Gijutsu Kenkyu Kumiai, Japan

SO Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

DT **Patent**

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 04305085	A	19921028	JP 1991-66508	19910329 <--
PRAI	JP 1991-66508		19910329	<--	

AB **Fertilizer granules** are coated with reaction products of **polyisocyanates** and **polyhydroxylated** compds. (wool grease, lanolin, lanolin fatty acids, and/or lanolin alcs). The **coating** materials are disintegrated in the soil and are nonpolluting.

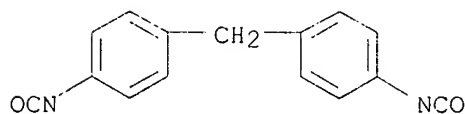
IT **101-68-8D**, reaction products with **polyhydroxylated** compds. **584-84-9D**, 2,4-Tolylenediisocyanate, reaction products with **polyhydroxylated** compds. **822-06-0D**, Hexamethylene diisocyanate, reaction products with **polyhydroxylated** compds. **4098-71-9D**, Isophorone diisocyanate, reaction products with **polyhydroxylated** compds.

RL: USES (Uses)

(fertilizer granule coatings)

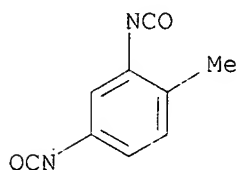
RN 101-68-8 HCAPLUS

CN Benzene, 1,1'-methylenebis[4-isocyanato- (CA INDEX NAME)



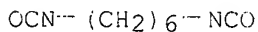
RN 584-84-9 HCAPLUS

CN Benzene, 2,4-diisocyanato-1-methyl- (CA INDEX NAME)



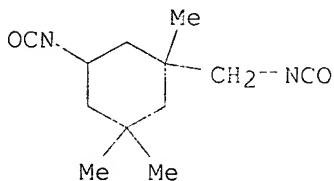
RN 822-06-0 HCAPLUS

CN Hexane, 1,6-diisocyanato- (CA INDEX NAME)



RN 4098-71-9 HCAPLUS

CN Cyclohexane, 5-isocyanato-1-(isocyanatomethyl)-1,3,3-trimethyl- (CA INDEX NAME)



L134 ANSWER 42 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 1991:80550 HCAPLUS

DN 114:80550

TI One-step manufacture of **controlled-release** plant nutrients

IN Moore, William P.

PA Melamine Chemicals, Inc., USA

SO U.S., 6 pp.

CODEN: USXXAM

DT **Patent**

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 4969947	A	19901113	US 1988-180831	19880412 <--
	CA 1333338	C	19941206	CA 1989-596538	19890412 <--
PRAI	US 1988-180831	A	19880412	<--	

AB A 1-step method of preparing **coated particulate** plant nutrients is described wherein a polyfunctional coupling agent is applied to a mobile mass of plant nutrient **particles** containing functional groups which are chemical reactive with the functional groups (e.g. NH<sub>2</sub>, OH, etc.) of the coupling agent, while simultaneously applying a 2nd reactive material containing functional groups also reactive with the functional groups of the coupling agent, and maintaining the mobile mass at 30-300° until strong, water-insol. **particles** are formed. The product of the 1-step method is a **controlled-release** plant nutrient having excellent attrition resistance. Diphenylmethane **diisocyanate** polymer was sprayed onto N **fertilizer** (mobile mass) and simultaneously was blended with anhydrous **polyol** containing 5-55% OH and 5-15% triethanolamine, and the temperature was kept at 85-115° for 2-10 min to give the **sustained-release fertilizer**.

IT 101-68-8D, polymers 822-06-0D, polymers

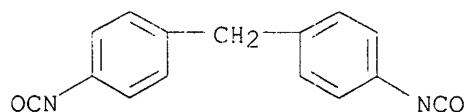
25656-78-4D, polymers

RL: BIOL (Biological study)

(sustained-release fertilizer coated by)

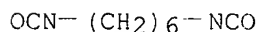
RN 101-68-8 HCAPLUS

CN Benzene, 1,1'-methylenebis[4-isocyanato- (CA INDEX NAME)]



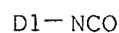
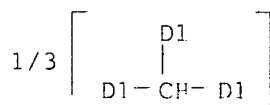
RN 822-06-0 HCAPLUS

CN Hexane, 1,6-diisocyanato- (CA INDEX NAME)



RN 25656-78-4 HCAPLUS

CN Benzene, 1,1',1''-methylidynetris[isocyanato- (CA INDEX NAME)]



IT 56-81-5D, 1,2,3-Propanetriol, polymers with coupling agent

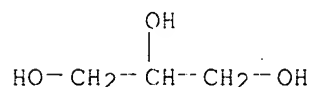
25265-75-2D, Butanediol, polymers with coupling agent

RL: BIOL (Biological study)

(sustained-release fertilizer  
coated with)

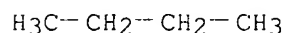
RN 56-81-5 HCAPLUS

CN 1,2,3-Propanetriol (CA INDEX NAME)



RN 25265-75-2 HCAPLUS

CN Butanediol (CA INDEX NAME)



2 ( D1-OH )

L134 ANSWER 43 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 1988:629467 HCAPLUS

DN 109:229467

TI Factors affecting nitrogen release of urea from reactive layer  
**coated urea**

AU Christianson, C. B.

CS Inst. Fert. Dev. Cent., Muscle Shoals, AL, 35662, USA

SO Fertilizer Research (1988), 16(3), 273-84

CODEN: FRESDF; ISSN: 0167-1731

DT Journal

LA English

AB An exptl. **fertilizer** called reactive layer **coated urea** (RLCU) has been developed by **coating** urea with a mixture of **diisocyanate** and **polyol** in the presence of a catalyst. The hard, durable layer that is formed on the **granule** conveys **slow-release** character to the product. A series of soil incubation tests were conducted under simulated upland conditions for periods up to 56 days to study the effect of factors such as temperature, pH, soil moisture, and organic C addns. on N **release**. The N **release** rate from RLCU was shown to be increased with increasing temperature and decreasing **coating** thickness. It was unaffected by the addition to lime to raise the pH or organic C sources to increase microbial activity. Although a slight effect of soil moisture was noted, it was not pronounced. Urea **release** tended to be in 2 stages: a constant diffusive stage in which, it is postulated, urea was still dissolving within the **granule** and diffusing to the soil at a constant rate and a slower logarithmic stage where the rate of **release** decreased with time.

IT 50-99-7, Glucose, biological studies

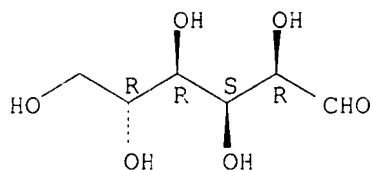
RL: BIOL (Biological study)

(soil amended with, nitrogen release from reactive layer **coated urea** in)

RN 50-99-7 HCAPLUS

CN D-Glucose (CA INDEX NAME)

Absolute stereochemistry.



L134 ANSWER 44 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 1988:149567 HCAPLUS

DN 108:149567

TI Attrition-resistant **controlled-release granular fertilizers**

IN Moore, William P.

PA USA

SO U.S., 8 pp.

CODEN: USXXAM

DT **Patent**

LA English

FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 4711659	A	19871208	US 1986-897160	19860818 <--
	US 4804403	A	19890214	US 1987-82236	19870806 <--
	CA 1300394	C	19920512	CA 1987-544504	19870813 <--
	WO 8801132	A1	19880225	WO 1987-US2015	19870817 <--
	W: AU, FI, JP, KR, NO, SU				
	RW: AT, BE, CH, DE, FR, GB, IT, LU, NL, SE				
	AU 8778502	A	19880308	AU 1987-78502	19870817 <--
	AU 594605	B2	19900308		
	EP 282513	A1	19880921	EP 1987-905544	19870817 <--
	EP 282513	B1	19911121		
	R: AT, BE, CH, DE, FR, GB, IT, LI, LU, NL, SE				
	JP 01500661	T	19890309	JP 1987-505079	19870817 <--
	JP 2532264	B2	19960911		
	EP 399567	A2	19901128	EP 1990-111924	19870817 <--
	EP 399567	A3	19920513		
	EP 399567	B1	19951115		
	R: AT, BE, CH, DE, FR, GB, IT, LI, LU, NL, SE				
	AT 69540	T	19911215	AT 1987-905544	19870817 <--
	AT 130287	T	19951215	AT 1990-111924	19870817 <--
	IN 168117	A1	19910209	IN 1987-CA650	19870818 <--
	IN 170148	A1	19920215	IN 1990-CA366	19900503 <--
	IN 170677	A1	19920502	IN 1990-CA367	19900503 <--
	JP 09188588	A	19970722	JP 1995-346888	19951213 <--
	JP 3237690	B2	20011210		
PRAI	US 1986-897160	A2	19860818	<--	
	US 1987-82236	A	19870806	<--	
	EP 1987-905544	A	19870817	<--	
	WO 1987-US2015	A	19870817	<--	
	IN 1987-CA650	A	19870818	<--	

AB The title **fertilizer** comprises a water-soluble central mass, a base **coating**, a water-insol. sealing layer, and, eventually, 1-5 water-insol. **coatings**. Urea **granules** were **coated** with polymeric diphenylmethane **diisocyanate** in such a way as to leave an excess of free NCO, which have not reacted with NH<sub>2</sub> group of the urea. The excess NCO was reacted with polyethyleneterephthalate polyester **polyol**, to form a water-insol. sealing layer. The **polyol** contained 10%

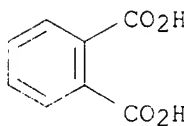
triethanolamine catalyst.  
IT 113673-21-5  
RL: BIOL (Biological study)  
(coating, for controlled-release  
fertilizer granules)  
RN 113673-21-5 HCAPLUS  
CN 1,2-Benzenedicarboxylic acid, polymer with 1,2-ethanediol and  
polymethylenepolyphenylene isocyanate (9CI) (CA INDEX NAME)  
CM 1  
CRN 9016-87-9  
CMF Unspecified  
CCI PMS, MAN

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

CM 2  
CRN 107-21-1  
CMF C2 H6 O2

HO-CH<sub>2</sub>-CH<sub>2</sub>-OH

CM 3  
CRN 88-99-3  
CMF C8 H6 O4

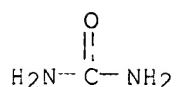


IT 56529-14-7, PAPI-urea copolymer  
RL: AGR (Agricultural use); BIOL (Biological study); USES (Uses)  
(fertilizer, sustained-release)  
RN 56529-14-7 HCAPLUS  
CN Isocyanic acid, polymethylenepolyphenylene ester, polymer with urea (9CI)  
(CA INDEX NAME)  
CM 1  
CRN 9016-87-9  
CMF Unspecified  
CCI PMS, MAN

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

CM 2  
CRN 57-13-6  
CMF C H4 N2 O





L134 ANSWER 45 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 1987:103950 HCAPLUS

DN 106:103950

TI Water-permeable **coatings** for **granular** water-soluble materials

IN Koegler, Hubert; Winter, Reinhard; Kuhlmann, Peter

PA Ashland-Suedchemie Kernfest G.m.b.H., Fed. Rep. Ger.

SO Ger., 6 pp.

CODEN: GWXXAW

DT **Patent**

LA German

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DE 3544451	C1	19870115	DE 1985-3544451	19851216 <--
	JP 62144784	A	19870627	JP 1986-296836	19861215 <--
	JP 07016648	B	19950301		
	EP 230601	A2	19870805	EP 1986-117434	19861215 <--
	EP 230601	A3	19881130		
	EP 230601	B1	19921111		
	R: AT, BE, CH, DE, ES, FR, GB, IT, LI, LU, NL, SE				
	AT 82240	T	19921115	AT 1986-117434	19861215 <--
	US 4772490	A	19880920	US 1986-942155	19861216 <--
PRAI	DE 1985-3544451	A	19851216	<--	
	EP 1986-117434	A	19861215	<--	

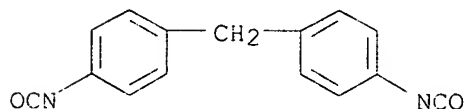
AB The title **coatings**, curable at room temperature without added heat, contain **polyisocyanates**, **polyols** prepared from phenols and aldehydes, alc. plasticizers, amine catalysts, and optionally alc. diluents. A 500-g portion of 15:15:15 N-P-K **fertilizer** (average **particle** size 3 mm) was **coated** with a mixture of 37.5 parts 60:36:18 1:1.6 PhOH-HCHO resin-castor oil-diacetone alc. mixture and 37.5 parts tech. MDI (30-32% NCO) in 3 portions and exposed to Et3N-saturated N at 20° for 24 h. When 12.5 g **coated fertilizer** was left in 250 g H2O at 22°, 21.2, 30.0, 31.5, 37.5, and 40.0% dissolved in 1, 2, 3, 4, and 5 wk, resp.; vs. 39.7, 51.2, 53.0, 59.0, and 62.0, resp., for a conventionally-**coated fertilizer**.

IT 101-68-8, MDI

RL: TEM (Technical or engineered material use); USES (Uses)  
(**coatings**, containing phenolic resins, water-permeable, for **granular** substances)

RN 101-68-8 HCAPLUS

CN Benzene, 1,1'-methylenebis[4-isocyanato- (CA INDEX NAME)



L134 ANSWER 46 OF 46 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 1974:412479 HCAPLUS

DN 81:12479  
 OREF 81:2025a,2028a  
 TI **Granular fertilizer** having dampproof coating  
 IN Nishida, Shigeru; Ikeda, Minoru  
 PA Dai Nippon Toryo Co., Ltd.  
 SO Jpn. Tokkyo Koho, 7 pp.  
 CODEN: JAXXAD  
 DT **Patent**  
 LA Japanese  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 48041991	B	19731210	JP 1964-3789	19640128 <--
PRAI	JP 1964-3789		19640128 <--		

AB **Granular fertilizers** having multiple-layer coatings were prepared by coating the granular fertilizers with (1) liquid thermosetting or thermoplastic resins, (2) powdered thermosetting or thermoplastic resins with or without fertilizer materials, and (3) powdered organic or inorg. dyes. The fertilizers had a low hygroscopicity, high strength, and long-lasting effects. Thus, mixed fertilizer [K<sub>2</sub>SO<sub>4</sub>-(NH<sub>4</sub>)<sub>2</sub>HPO<sub>4</sub>] granules were coated with a poly(urethane) resin solution, followed by heat treatment; polyol X-450 was added to the mixture; the coated granules were passed through gas flame. The coating process was repeated.

=> d his

(FILE 'HOME' ENTERED AT 07:00:01 ON 13 FEB 2008)  
 SET COST OFF

FILE 'WPIX' ENTERED AT 07:00:13 ON 13 FEB 2008

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L1      23917 S C05G/IPC,IC,ICM,ICS OR (C14-T OR B14-T OR C12-N08 OR B12-N08
L2      118 S L1 AND (A05-G01E1 OR G02-A05)/MC
L3      245 S ((P111 OR P112 OR P113) (S) (R120 OR R307 OR R522))/M0,M1,M2,M3
L4      336 S L2,L3
L5      43 S L4 AND (?ISOCYAN? OR ISO CYAN? OR POLYISO CYAN?)
L6      336 S L4-L5
L7      107 S L6 AND (R051 OR R052)/M0,M1,M2,M3,M4,M5,M6
L8      95 S L6 AND (C12-M10 OR B12-M10 OR C12-M10A OR B12-M10A OR C12-M10
L9      119 S L7,L8
L10     21994 S L1 AND (PD<=20031002 OR PRD<=20031002 OR AD<=20031002)
L11     15495 S (P111 OR P112 OR P113)/M0,M1,M2,M3,M4,M5,M6 AND (PD<=20031002
L12     268 S L10,L11 AND L4
L13     2087 S L10,L11 AND ?COAT?
L14     2131 S L12,L13
L15     96 S L14 AND L9
L16     23 S L9 NOT L15
          SEL AN 21 23 L16
L17     2 S L16 AND E1-E2
L18     78 S L15 NOT (?ISOCYAN? OR ISO CYAN? OR POLYISO CYAN?)
L19     92 S L15 NOT (C10-A14 OR E10-A14)/MC
L20     14 S L19 NOT L18
L21     78 S L18,L19 NOT L20
L22     41 S L10,L11 AND (C10-A14 OR B10-A14)/MC
L23     212 S L10,L11 AND (?ISOCYAN? OR ISO CYAN? OR POLYISO CYAN?)
L24     37 S L22 NOT L15-L21
          SEL AN 3 6 L24
L25     2 S L24 AND E3-E4

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L26 178 S L23 NOT L15-L21,L24  
 SEL AN 3 12 20 22 52 65 79 81 83 99 104 141 150 152 154 155 159  
 L27 18 S L26 AND E5-E22  
 L28 1 S US20050076687/PN OR US2003-682347#/AP, PRN  
 E WHITTINGTON/AU  
 L29 8 S E4,E5  
 E WHITTINGTON/PA  
 L30 3 S E4,E5  
 L31 8 S L28-L30  
 L32 1 S L31 AND L1,L10,L11  
 L33 22 S L17,L25,L27,L28,L32  
 L34 7 S L31 NOT L33  
 L35 22 S L33 AND L1-L34  
 L36 22 S L35 AND (?CYAN? OR ?POLYOL OR ?POLY OL OR (SLOW OR CONTROL? O  
 L37 22 S L36 AND (?ISOCYAN? OR ISO CYAN? OR POLYISO CYAN? OR POLY() (IS  
 L38 19 S L37 AND (POLYOL OR POLY OL OR POLYHYDROX? OR POLY HYDROX?)  
 L39 3 S L37 NOT L38  
 L40 22 S L37-L39  
 L41 7 S L40 AND (PLANT. OR VEGETABL? OR COTTONSEED OR COTTON SEED OR L  
 L42 6 S L40 AND (?WAXY? OR ?WAXE? OR WAX? OR ?POWD? OR DIATOM?(L)EART  
 L43 1 S L40 AND (BA OR BARIUM) () (SULFATE OR SULPHATE)  
 L44 1 S L40 AND OIL(S) DYE?  
 L45 2 S L40 AND (CU OR COPPER OR CUPR? OR ZN OR ?ZINC? OR MICRONUTRI?  
 L46 1 S L40 AND (DIBUTYL (S) TIN (S) DILAURATE)  
 L47 22 S L40-L46

FILE 'WPIX' ENTERED AT 07:51:42 ON 13 FEB 2008

FILE 'HCAPLUS' ENTERED AT 07:51:59 ON 13 FEB 2008

L48 1 S US20050076687/PN OR US2003-682347#/AP, PRN  
 E WHITTINGTON/AU  
 L49 5 S E4,E11  
 L50 1 S L48 AND L49  
 SEL RN

FILE 'REGISTRY' ENTERED AT 07:53:04 ON 13 FEB 2008

L51 2 S E1-E2  
 L52 1 S 39394-41-7  
 L53 1 S L51 AND PMS/CI  
 L54 1 S L51 NOT L53  
 E DIBUTYL TIN DILAURATE/CN  
 E C32H64O4SN/MF  
 L55 11 S E3  
 SEL RN 1 3 4 6 8 9  
 L56 5 S L55 NOT E1-E6  
 L57 71 S (CU OR ZN)/MF NOT MASS  
 L58 751 S (CU AND ZN)/ELS AND 2/ELC.SUB

FILE 'HCAPLUS' ENTERED AT 07:58:54 ON 13 FEB 2008

L59 204 S L52 OR L53  
 L60 394090 S FERTILIZ?/SC, SX, CW, CT OR C05G/IPC, IC, ICM, ICS  
 E FERTILIZER/CT  
 L61 86367 S E3,E10  
 L62 86368 S E10-E83  
 E E10+ALL  
 L63 86367 S E10,E11  
 L64 23541 S E15+OLD, NT OR E19+OLD, NT  
 L65 19300 S E22+OLD, NT  
 E E20+ALL  
 L66 29988 S E2+OLD

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      E E8+ALL
      E E23+ALL
L67      4040 S E1
L68      444717 S L60-L67 OR ?FERTILIZ? OR ?FERTILS?
      E POLYURETHANE/CT
      E E145+ALL
L69      542 S L68 AND E17+OLD
L70      3 S L68 AND E16(L)POLY?
L71      582 S L68 AND (?POLYURETHAN? OR POLY URETHAN?)
      E POLYISOCYAN/CT
L72      372 S L68 AND (?ISOCYAN? OR ISO CYAN? OR POLYISO CYAN? OR POLY() (IS
L73      1 S L59 AND L68
L74      728 S L68 AND ?URETHAN?
L75      922 S L69-L74
L76      248 S L75 AND PY<=2003 NOT P/DT
L77      490 S L75 AND (PD<=20031002 OR PRD<=20031002 OR AD<=20031002) AND P
L78      738 S L76,L77
L79      77 S L78 AND (POLYOL OR POLY OL OR POLYHYDROX? OR POLY HYDROX?)
L80      17 S L78 AND (POLYHYDRIC OR POLY HYDRIC)
      E POLYOL/CT
      E E4+ALL
L81      12 S L78 AND E2
      E E1
      E E4+ALL
L82      3 S L78 AND E2
      E E1
      E E4+ALL
L83      0 S L78 AND E2
      E E1
      E E6+ALL
L84      1 S L78 AND E2
      E E1
      E E7+ALL
L85      43 S L78 AND E2,E3,E4
L86      113 S L79-L85
L87      5 S L78 AND (L54 OR (BA OR BARIUM) () (SULFATE OR SULPHATE))
L88      5 S L78 AND L56
L89      22 S L78 AND L57
L90      0 S L78 AND L58
L91      5 S L87-L89 AND L79-L85
      SEL AN 1 2 4
L92      2 S L91 NOT E1-E6
L93      26 S L87-L89 NOT L91
      SEL AN 13
L94      1 S L93 AND E7-E8
L95      108 S L86 NOT L87-L94
L96      55 S L95 AND ?COAT?
L97      32 S L95 AND (SLOW OR CONTROL? OR DELAY? OR SUSTAIN?) (L)RELEAS?
L98      58 S L96,L97
L99      53 S L98 NOT PHARMACEUT?/SC,SX
L100     51 S L99 NOT A61K/IPC,IC,ICM,ICS
      SEL AN 4 12 18 20 25 26 50
L101     44 S L100 NOT E9-E22
L102     45 S L94,L101
L103     7 S L98 NOT L100
L104     50 S L95 NOT L96-L103
      SEL AN 14 24
L105     2 S E23-E26 AND L104
L106     48 S L102,L105,L48,L50 AND L48-L50,L59-L105
L107     7 S L106 AND (PLANT OR VEGETA? OR COTTONSEED OR COTTON SEED OR LI

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L108 1 S L106 AND METHYL ESTER  
L109 38 S L106 AND (?POLYOL? OR ?POLY OL OR POLYHYDR? OR POLY HYDR?)  
L110 41 S L106 AND (?PARTICLE? OR ?PARTICULAT? OR ?GRANUL? OR ?CAPSUL?)  
L111 48 S L106-L110

FILE 'REGISTRY' ENTERED AT 08:25:29 ON 13 FEB 2008

FILE 'HCAPLUS' ENTERED AT 08:25:29 ON 13 FEB 2008

L112 TRA L111 1- RN : 147 TERMS

FILE 'REGISTRY' ENTERED AT 08:25:30 ON 13 FEB 2008

L113 147 SEA L112  
L114 64 S L113 AND PMS/CI  
L115 13 S L114 AND N/ELS  
L116 26 S L114 AND (POLYURETHAN? OR POLYISOCYAN? OR POLYCYAN?)/PCT  
L117 30 S L115,L116  
L118 29 S L117 NOT C3H5NO  
L119 34 S L114 NOT L117  
L120 13 S L119 AND (C2H4O OR C3H6O)  
L121 11 S L120 NOT (ETHENOL OR ETHENYLBENZENE)  
L122 83 S L113 NOT L114-L121  
L123 1 S L122 AND OC5/ES  
L124 82 S L122 NOT L123  
L125 4 S L124 AND (SN OR BA)/ELS  
SEL RN 1 3  
L126 2 S L125 NOT E27-E28  
L127 10 S L124 AND (C12H18N2O2 OR C22H13N3O3 OR C8H12N2O2 OR C4H10O2 OR  
L128 1 S L124 AND OC2/ES  
L129 54 S L116,L121,L123,L126,L127,L128  
L130 55 S L51-L54,L129

FILE 'HCAPLUS' ENTERED AT 08:35:38 ON 13 FEB 2008

L131 43 S L130 AND L111  
L132 5 S L111 NOT L131  
L133 3 S L132 NOT (1973:419926 OR 1966:467310)/AN  
L134 46 S L131,L133

FILE 'HCAPLUS' ENTERED AT 08:37:15 ON 13 FEB 2008

=> => fil reg

FILE 'REGISTRY' ENTERED AT 08:38:14 ON 13 FEB 2008

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STRUCTURE FILE UPDATES: 12 FEB 2008 HIGHEST RN 1003006-87-8

DICTIONARY FILE UPDATES: 12 FEB 2008 HIGHEST RN 1003006-87-8

New CAS Information Use Policies, enter HELP USAGETERMS for details.

TSCA INFORMATION NOW CURRENT THROUGH June 29, 2007

Please note that search-term pricing does apply when  
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REGISTRY includes numerically searchable data for experimental and  
predicted properties as well as tags indicating availability of

experimental property data in the original document. For information on property searching in REGISTRY, refer to:

<http://www.cas.org/support/stngen/stndoc/properties.html>

=> d ide can 153

L53 ANSWER 1 OF 1 REGISTRY COPYRIGHT 2008 ACS on STN  
 RN 849765-90-8 REGISTRY  
 ED Entered STN: 04 May 2005  
 CN Poly[oxy(methyl-1,2-ethanediyl)],  $\alpha$ -hydro- $\omega$ -hydroxy-, ether with 2-ethyl-2-(hydroxymethyl)-1,3-propanediol (3:1), polymer with Isonate 143L (9CI) (CA INDEX NAME)  
 MF ((C3 H6 O)n (C3 H6 O)n (C3 H6 O)n C6 H14 O3 . Unspecified)x  
 CI PMS  
 PCT Manual component, Polyether, Polyurethane, Polyurethane formed  
 SR CA  
 LC STN Files: CA, CAPLUS, USPATFULL

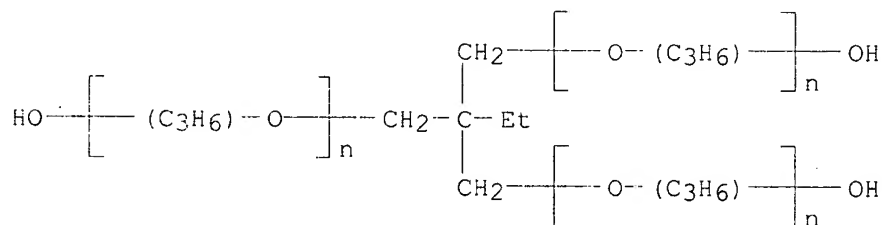
CM 1

CRN 39394-41-7  
 CMF Unspecified  
 CCI MAN

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

CM 2

CRN 25723-16-4  
 CMF (C3 H6 O)n (C3 H6 O)n (C3 H6 O)n C6 H14 O3  
 CCI IDS, PMS



1 REFERENCES IN FILE CA (1907 TO DATE)  
 1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 142:391676

=> d ide can 152

L52 ANSWER 1 OF 1 REGISTRY COPYRIGHT 2008 ACS on STN  
 RN 39394-41-7 REGISTRY  
 ED Entered STN: 16 Nov 1984  
 CN Isonate 143L (CA INDEX NAME)  
 OTHER NAMES:  
 CN Dow 143L  
 DR 54391-99-0, 39277-71-9  
 ENTE A mixture of 4,4'-diphenylmethane diisocyanate, carbodiimide, and

trifunctional cycloadduct (Upjohn Co.)  
MF Unspecified  
CI COM, MAN  
LC STN Files: AGRICOLA, CA, CAPLUS, CHEMLIST, IFICDB, IFIPAT, IFIUDB,  
PROMT, TOXCENTER, USPAT2, USPATFULL

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

202 REFERENCES IN FILE CA (1907 TO DATE)

125 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA

202 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 147:542400

REFERENCE 2: 147:33668

REFERENCE 3: 147:11901

REFERENCE 4: 146:423228

REFERENCE 5: 146:319092

REFERENCE 6: 146:318258

REFERENCE 7: 145:363631

REFERENCE 8: 145:278427

REFERENCE 9: 145:272271

REFERENCE 10: 144:213960

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